

SMC FFRDC Users Guide



DEPARTMENT OF THE AIR FORCE

Headquarters, Space and Missile Systems Center (AFMC)

Los Angeles AFB CA 90009-2960

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Acquisition Management

THE AEROSPACE FEDERALLY FUNDED RESEARCH AND DEVELOPMENT CENTER TECHNICAL SUPPORT

This users *guide* establishes policies, procedures and assigns responsibilities for the utilization of the Federally Funded Research and Development Center (FFRDC) operated by The Aerospace Corporation (hereafter referred to as the “Aerospace FFRDC”) by the Air Force (AF) Space and Missile Systems Center (SMC). It applies to all Air Force activities, other Department of Defense (DoD) agencies, other Government agencies and other organizations acquiring Aerospace FFRDC support for national security space systems planning, acquisition, and operation through the Air Force contract (or contracts) with The Aerospace Corporation. It also provides using guidance related to proper use of the FFRDC using separate contracts for Aerospace FFRDC services between non-DoD Government agencies and other organizations and the Aerospace as appropriate. Guidance for work performed under Non-FFRDC contracts by the Aerospace Corporation can be found in Annex 10 D1b and Annex 11. It also covers the use of the Aerospace Corporation for Non-FFRDC activities. This regulation complies with FAR Section 35.017 entitled “Federally Funded Research and Development Centers”, and Air Force Materiel Command Instruction (AFMCI) 64-103 entitled Administration of Contracts Awarded to Federally Funded Research and Development Centers (FFRDC). In accordance with AFMCI 64-103, SMC FFRDC Users Guide including all its annexes and attachments in conjunction with the

Award Fee Plan (Annex 8, Atch 1)) attached to the contract serves as the FFRDC surveillance plan. This guide supplements the Air Force-Aerospace FFRDC Sponsoring Agreement by describing in more detail the operating procedures, interfaces and working relationships between SMC and the Aerospace FFRDC, and procedures for interfacing with other SMC contractors, other Air Force organizations and other Government agencies in all work the Aerospace FFRDC performs in support of the Air Force.

1. The Aerospace Corporation. The Aerospace Corporation, through an annual incrementally funded research and development Air Force contract which coincides with the Government's Fiscal Year, operates an FFRDC which provides scientific and engineering support and is assigned responsibility for accomplishment of the General Systems Engineering and Integration (GSE&I) or Technical Review (TR) function on specifically identified programs. The Aerospace FFRDC also provides technical support, in the areas of:

- a. Mission performance of space systems.
- b. Plans and system architecture.
- c. International technology assessments.
- d. Selected research, development, test and evaluation.
- e. Mission-Oriented Investigation and Experimentation.
- f. Multi-program systems enhancement.
- g. Acquisition support.
- h. Engineering methods.

More detailed description of Aerospace Task and Support areas can be found in Annex 2.

The Air Force recognizes that certain scientific and engineering support which is not directly related to national security space systems planning, acquisition, and operation, but which is beneficial to the Corporation as a whole, is excluded from the Aerospace FFRDC operations but can be performed by The Aerospace Corporation. Examples of such support include, but are not limited to, the following:

Commercial work to support specific space and space related tasks, government use of commercial launch vehicles, support to foreign governments or organizations in space or space related areas, utilization of space related technologies to support non-space related national

priority areas and work that enhances the US competitive stature in the space arena in world markets.

2. Terms Explained:

a. General Systems Engineering and Integration (GSE&I). GSE&I deals with the broad area of systems engineering and the tasks associated with integrating multiple subsystems into a total system. Detailed task descriptions are to be found in Annex 2, “FFRDC Tasks,” but all fall into one of the following ten basic categories of effort:

- (1) Systems Studies – including design and trade studies
- (2) Work Statement and Proposal Preparation
- (3) Specifications and Top-Level Documentation
- (4) Technical Development – including program schedules and performance monitoring
- (5) Technical Meetings – including Technical Interchange Meetings and briefings to Air Force management
- (6) Review and Evaluation of Critical Documents – including all contractually required technical documentation such as Program Plans and Systems Test Plans.
- (7) Review and Evaluation of Contractor System Design and Analysis – including mathematical analysis and simulation of critical design elements
- (8) Review of Contractor Technical Performance – including design reviews and systems tests
- (9) Integration and Configuration and Interface Control – including launch facility integration and interface control
- (10) Flight Test and Operations – including pre-launch, launch, post-launch, and orbital operations

b. Technical Review (TR). This is the process of appraising the technical performance of contractors. Detailed task descriptions are to be found in Annex 2, “FFRDC Tasks,” and are included in categories 4 through 9 of the ten basic categories of GSE&I effort listed above in paragraph 2a.

c. Technical Support (TS).

TS deals with the broad area of technical support to various organizations within SMC. Detailed task descriptions are to be found in Annex 2, “FFRDC Tasks,” but all fall into one of the following six basic categories of effort:

- (1) Selected Research, Development, Test and Evaluation Tasks (SRDT&E).
- (2) Plans and System Architecture (P&SA).
- (3) Mission-Oriented Investigation and Experimentation (MOIE).
- (4) Multi-Program Systems Enhancement (MPSE).
- (5) Engineering Methods (EM).
- (6) International Technology Assessment (ITA).

d. Staff Years of Technical Effort (STE). The technical services provided by the Aerospace FFRDC are performed largely by scientists and engineers who provide professional level technical work in the fields of Systems Engineering, System Integration, Engineering Sciences, Systems Planning and Basic and Applied Research, based on their extensive experience and technical education. These scientists and engineers are referred to as Members of the Technical Staff or “MTS.” The work unit of measure for technical support to individual programs/projects is a Staff Year of Technical Effort or STE. One STE is equivalent to 1810 direct labor hours of MTS effort. The terms STE or MTS year are used interchangeably.

3. Policy. The following policy has been established for the utilization of Aerospace FFRDC technical resources by the Air Force. It similarly applies to other DoD agencies and other Government agencies, as appropriate.

a. Considerations Necessary to Justify Use of the Aerospace FFRDC Resource. The Chief Engineer's Office, the Program Executive Office Offices (PEO) for Space and Strategic Systems, SMC, the National Reconnaissance Office (NRO), Space Command, other AF and other DoD and government users, the System Program Directors, and the Project Managers/Officers as well as other Non-DoD users determine the requirements for the use of the Aerospace FFRDC resources. Prior to allocation of Aerospace FFRDC resources, a determination of the appropriateness of using the Aerospace FFRDC must be made by the requesting activity and submitted in writing to the SMC Chief Engineer (SMC/AX) in accordance with Annex 3.

b. Government Direction to Aerospace Personnel. Any direction to the Aerospace FFRDC to perform work other than that required by the contract is prohibited and may constitute a violation of the Anti Deficiency Act, 31 USC 1341. Any question concerning the Aerospace FFRDC's responsibility to perform a given task must be immediately referred to the Contracting Officer for resolution. In the event the Aerospace FFRDC performs work other than that required by the SMC contract or any other FFRDC contract, The Aerospace Corporation does so at its own risk.

c. Direction to Other Air Force Contractors. Direction to Air Force contractors, including technical direction, shall be given solely by the Air Force. The Aerospace FFRDC personnel are not authorized to direct these contractors in any manner.

d. Assignment of Responsibility. While the Aerospace FFRDC is responsible for scientific and engineering program tasks, the assignment of responsibilities for GSE&I or TR by the Air Force to the Aerospace FFRDC does not relieve the Air Force from its overall responsibility in these areas.

(1) The "Air Force Space and Missile Systems Center (SMC) Procedures for Allocation of Resources of the Aerospace FFRDC Among DoD Agencies" (Annex 1) provides the criteria for assigning tasks to support specific organizations and programs to the Aerospace FFRDC by a DoD agency.

(2) The appropriate FFRDC tasks for the Aerospace Corporation FFRDC to perform are outlined in Annex 2.

(3) The process and procedures to place FFRDC work on the Aerospace Corporation FFRDC contract(s) are explained in Annex 3. This covers DoD, Non-DoD government and other users of the FFRDC contract(s).

(4) The process and procedures to place Non-DoD FFRDC work on direct contract with the Aerospace Corporation FFRDC are outlined in Annex 4. It provides the criteria for selection and

justification for the Aerospace FFRDC to perform work for a non-DoD agency as well as SMC's role in reviewing such work.

e. Precautions. In order to ensure that the unique capabilities of the Aerospace FFRDC are appropriately utilized, the following criteria are established:

(1) Proximity of the Aerospace FFRDC should not result in the use of its capabilities for routine technical, administrative, or management tasks. Such use diverts skills and funds which should be devoted to priority technical tasks.

(2) Augmentation of the Air Force technical staff through the use of Aerospace FFRDC manpower must be avoided. Such augmentation would have the effect of circumventing manpower ceilings and evading the intent of the Civil Service regulations. The Air Force contract with the Aerospace FFRDC is for performance of specific technical roles and tasks in support of designated programs that are supported by a TO&P, and not for the services of individual MTS.

(3) The Aerospace FFRDC is precluded from performing any work that industry can perform. In accordance with Annex 3, each requesting government official shall certify that the requested work cannot be performed by any organic (U.S. government work force) resources, industry at large, or SETAs.

f. Enabling Clauses.

(1) When the Aerospace FFRDC has been assigned the GSE&I or TR role, the interface with the contractor will be prescribed by an appropriate enabling clause to assure that the Aerospace FFRDC has access to contractor and subcontractor technical information, facilities, and activities and has their cooperation. Without such a clause there is no legal basis for the Aerospace FFRDC/contractor interaction, nor protection of either party in the event of any inappropriate disclosure.

(2) Two standard enabling clauses are provided in Annex 6. They will be used as follows:

(a) The GSE&I clause will be included in all system program contracts where the Aerospace FFRDC has been assigned the GSE&I role.

(b) The TR clause will be included in all contracts where the Aerospace FFRDC has been assigned the TR role.

(3) Selection of the applicable enabling clause on SMC contracts requires the coordination and approval by the Contracts Management Office (AXC). These clauses should also be used by other Air Force or other DoD organizations using Aerospace in a GSE&I or TR role. The program office will submit the following information to SMC/AXC concerning the contractor with which the Aerospace FFRDC is proposed to interface:

(a) Program/Project title

(b) Contract title, number

(c) Contractor

(d) Period of performance

(e) Enabling clause selected (Based on the role established in the TO&Ps)

(4) Data Item Description DI-S-30561A, should be considered for inclusion in the Contract Data Requirements List (CDRL) of contracts for which the Aerospace FFRDC has GSE&I or TR responsibility.

4. Responsibilities. To implement the policy set forth in Paragraph 3., the following responsibilities are assigned: The SMC Chief Engineer's Office, the Program Executive Offices (PEO) for Space and Strategic Systems, NRO, Space Command and other AF, DoD and Non-DoD customers, the System Program Directors, and the Project Managers/Officers determine their technical requirements which are then documented in their TO&Ps and incorporated into the SMC contract for the operation of the Aerospace FFRDC contract by reference.

a. SMC Contracts Management Office (AXC). The SMC Contract Management Office (AXC) serves as the focal point for all Aerospace FFRDC contractual matters. In this role, AXC:

- (1) Negotiates, awards, and administers the Air Force contract with the Aerospace Corporation and makes all changes thereto.
- (2) Authorizes the Aerospace FFRDC to perform effort upon receipt of approved program requests supported by adequate funding from SMC System Program Offices and other users.
- (3) Provides SMC/FMB with the priced out MTS plan cost estimate as soon as available.
- (4) In conjunction with the SMC Chief Engineer, provides training to the Functional Area Chiefs (FACs) and Functional Area Evaluators (FAEs).
- (5) In conjunction with the SMC Chief Engineer, makes a determination of reasonableness and accuracy of the Aerospace FFRDC billings.
- (6) Supports the SMC Chief Engineer on all contractual, administrative, and program management matters.

b. SMC Chief Engineer's Office (SMC/AX).

- (1) Provides policies and procedures for proper management environment between the Aerospace FFRDC and the Air Force.
- (2) Issues calls for identification of Aerospace FFRDC support requirements from all FFRDC user organizations including requests for TO&Ps preparation and submittal.
- (3) Reviews requests for Aerospace FFRDC support for adequacy of justification.
- (4) Provides engineering functional review of all proposed TO&Ps, assures the effort is adequately described, and reviews the STE level requested.

- (5) Prepares summary of Aerospace FFRDC support requirements submitted by requesting agencies.
- (6) Reviews and recommends allocations of Aerospace FFRDC STE deliveries to the SMC Commander for approval.
- (7) Reviews and recommends allocations of Aerospace FFRDC STE deliveries to the SMC Commander for approval by 15 September for the next fiscal years contract.
- (8) Coordinates and resolves Aerospace FFRDC STE allocation priority matters among the System Program Offices.
- (9) Acts as the responsible SMC reviewing agent for non-SMC programs and other FFRDC efforts outside of SMC System Program Offices' responsibility.
- (10) Maintains records of Aerospace FFRDC efforts within his/her area of responsibility.
- (11) Collects, summarizes and forwards the semiannual performance evaluations through SMC/AXC to the Aerospace FFRDC in accordance with Annex 8.
- (12) In conjunction with SMC/AXC, informs the Aerospace FFRDC on mid-term and long-term issues significant to the Aerospace FFRDC which will aid it in making near-term, high-leverage decisions and in taking actions to manage its resources so it can best perform its mission in the future. The information should cover new program activities, shifts in program emphasis, new technologies, resource needs, shifts in roles and responsibilities, organizational interfaces and anticipated initiatives.
- (13) Provides SMC/AXC and SMC/FMB with the approved MTS allocations at the beginning of the fiscal year and any changes thereto at a minimum of semi-annually.
- (14) Maintains current list of assigned FACs and FAEs.

(15) Provides technical support to the contracting office (AXC) as required.

(16) The SMC Chief Engineer (AX) or his designee will be responsible for the oversight management of the Mission Oriented Investigation & Experimentation (MOIE) program carried out by the Aerospace FFRDC. In conjunction with the Aerospace MOIE program manager, AXE will be responsible for initiating the fiscal year MOIE plan and coordinating this plan with SMC and NRO program offices, SMC/XR and AF Laboratories as appropriate. As part of this coordination AX will solicit requirements to initiate the process and comments on the proposed plan as well as from appropriate program officials, XR and the AF labs. The SMC Chief Engineer will review the coordinated plan and make the approval determination. AXE is responsible for oversight management of Aerospace's MOIE efforts. These MOIE efforts will be described in appropriate TO&P(s) (AFSC Form 1640) signed off by the Aerospace MOIE manager and AXE. Semi-annual evaluations of the MOIE activities (AFSC Form 1641) will be made by AXE. All proposed changes (during the fiscal year) to the approved MOIE plan will be coordinated with and approved by the SMC Chief Engineer.

c. System Program Offices (SPOs) and Other AF/DoD/Non-DoD Points of Responsibility, all referred to as SPOs.

(1) SPOs determine, coordinate and justify requirements for Aerospace FFRDC support of programs under their responsibility and submit them to the SMC Chief Engineer; keep the Chief Engineer informed about changes of these total requirements for Aerospace FFRDC support which occur during the contract period.

(2) Ensure proper coordination of all proposed TO&Ps through appropriate in-house functional experts prior to submittal to the Chief Engineer's Office.

(3) Review TO&Ps to ensure tasks are specific and clear enough to develop accurate estimates of the level of support required to meet program objectives.

(4) SPOs are responsible for the utilization of Aerospace FFRDC resources within their area of responsibility. Shifts of resources must be reported to the Chief Engineer's office.

(5) In support of their area of responsibility, review and discuss Aerospace FFRDC technical efforts, accomplishments, MTS deliveries, current status and planned efforts for the follow-on period with appropriate Aerospace FFRDC management.

(6) Maintain records of Aerospace FFRDC technical activities and resource utilization for their area of responsibility.

(7) Provide the Chief Engineer's office with current identification of the program's FACs and FAEs as changes occur.

d. System Program Office Director, Project Manager/Officer Responsibilities as Functional Area Chiefs (FACs).

(1) Determine and justify requirements for Aerospace FFRDC support of programs under their jurisdiction and submit them to the appropriate SPO; keep the SPO informed about changes of requirements for Aerospace FFRDC support which occur during the contract period.

(2) Perform an independent government estimate of proposed tasking

(3) Budget, and fully funds the requested STE support by 30 November unless under Continuing Resolution Authority (CRA). The Project Manager/Officer shall provide a funded order to SMC/FMB which will be accepted on a reimbursable basis.

(4) Prepare Technical Objectives and Plans (TO&Ps) in coordination with the appropriate Aerospace FFRDC office and in accordance with instructions contained in paragraph 5b and Annex 3. Further refine the scope of TO&Ps to ensure timely and current emphasis.

- (5) Ensure TO&P tasks are specific and clear enough to develop accurate estimates of the level of support required to meet program objectives and permit an objective evaluation of assigned tasks.
- (6) Prepare Aerospace FFRDC performance evaluations in accordance with Annex 8.
- (7) Review, accept/approve and process technical reports (TRs) and review, approve or revise the distribution list for Technical Operating Reports (TORs) delivered by the Aerospace FFRDC for fulfillment of contractual requirements.
- (8) Keep the appropriate SPO informed of significant Aerospace FFRDC activities regarding changes in technical requirements, management problems, and policy matters. Keep SMC/AXC informed on contractual matters.
- (9) Monitor Aerospace FFRDC technical support in accordance with SMC guidelines, and provide necessary guidance to the cognizant Aerospace FFRDC Director on a continuing basis and through scheduled reviews (paragraph 5k(1)).
- (10) Assign the Functional Area Evaluator (FAE) and identify appointed FAEs to the Chief Engineer.
- (11) Ensure FAEs have received training on FFRDC users guide.
- (12) Ensure the FAE understands the technical disciplines required to determine acceptability of FFRDC performance.
- (13) Provide FAEs instructions regarding the regular review of the Aerospace FFRDC's cost and performance and enforcement of the criteria contained in this regulation.
- (14) Maintain records of Aerospace FFRDC efforts within area of responsibility.

e. Functional Area Evaluators (FAEs).

- (1) Maintain surveillance records. Annex 9 constitutes the surveillance plan.
 - (2) Notify the ACO and FAC about any contract problems requiring their involvement for resolution.
 - (3) Does not authorize any changes to the contract. Only the Contracting Officer can bind the government and direct the contractor to perform work.
 - (4) Submit performance evaluation reports in accordance with Annex 8.
 - (5) Maintain familiarity with the technical requirements (TO&Ps) for which technical oversight is provided.
 - (6) Attend training on FFRDC technical oversight responsibilities as required.
 - (7) Maintain records of Aerospace FFRDC efforts within area of responsibility.
- f. Comptroller (SMC/FM).

- (1) SMC/FMB will be responsible for obtaining reimbursable budget authority to fund the entire Aerospace FFRDC contract as directed by SMC/AXC.
- (2) Obtains funding from SMC System Program Offices and other users based on price-out provided by SMC/AXC to cover reimbursable funding. Contract should be fully funded by 31 December.

g. The Aerospace FFRDC. In view of the special relationship that exists, the Air Force and the Aerospace FFRDC work closely together; however, the Aerospace FFRDC must take the initiative within its assigned areas of responsibility, carry out its efforts in a professionally responsible and objective manner, and be accountable for the results of its work through written documentation and transmittal of its recommendations and supporting technical information to the Air Force.

5. Further Definition and Description of Tasks/Responsibilities:**a. Introduction:**

(1) In order to provide for effective performance of the Aerospace FFRDC's commitments under the contract, SMC and the Aerospace FFRDC have mutually agreed upon a further definition and description of tasks and responsibilities. These are set forth in this document in sufficient detail to provide guidance to SMC and Aerospace FFRDC operating personnel.

(2) The contract entered into each fiscal year between the sponsoring agency (AF) and The Aerospace Corporation for the operation of the Aerospace FFRDC places requirements on the Aerospace FFRDC for performance of technical work and specifies various terms and conditions under which that work shall be performed. It specifies the direct STE labor hours to be delivered, and sets forth specific categories of effort and a list of the programs to be supported in each category. The tasks in each program are specifically defined in the Technical Objectives and Plans (TO&Ps). Approved MTS years and/or dollar constraints are contractually authorized by SMC/AXC for each program. The cost for each MTS year includes the efforts of the MTS and all other supporting cost resources.

b. Technical Objectives and Plans (TO&Ps).

(1) TO&Ps, required by the AF/Aerospace FFRDC contract, are prepared or updated each fiscal year, and as required intermittently, for each activity for which the Aerospace FFRDC is assigned technical responsibility under the Statement of Work (SOW). TO&Ps must be prepared by all users of the Aerospace FFRDC covered by the SMC contract. The TO&P is prepared on SMC Form 1640, "Technical Objectives and Plans." Annex 2 reflects a standard series of tasks applicable to GSE&I which are in consonance with contractual requirements and current practices. It is intended that the scope of Aerospace FFRDC GSE&I work be defined using the tasks contained in Annex 2. The TO&P will cite Annex 2 and list the tasks to be performed. For responsibilities other than GSE&I, standardization of task descriptions is not practical. However, the general principles as well as selected tasks from the list in Annex 2 will be used as applicable

in formulating specific task lists for these other areas. Annex 3 provides the format instructions for TO&Ps.

(2) The TO&P is jointly prepared, reviewed and/or updated for the follow-on (fiscal) year by the responsible SMC System Program Office Director/Project Manager/Officer in cooperation with the appropriate Aerospace FFRDC Director/Manager and, after coordination and resulting agreement has been reached, is provided to the SMC Chief Engineer for review and comment. Review for compliance with Air Force policies, regulations and practices and contractual sign-off are to be accomplished prior to 15 September. TO&Ps upon which agreement has been obtained will be published and distributed by 30 September. For those in which agreement has not been achieved, the areas of disagreement will be identified and submitted to higher levels at SMC and the Aerospace FFRDC for resolution. Publication will take place as soon as possible after resolution is accomplished. Procedures are similar for all other users of the FFRDC under the contract.

(3) A similar procedure is followed for any new work agreed to between the Aerospace FFRDC and SMC and other FFRDC users and initiated during the contract period. For new work, coordination, publication and distribution of TO&Ps are to be accomplished within 60 days from the date of authorization and acceptance of the work.

(4) Revisions to TO&Ps are made when there are major changes in the program or activity or in responsibilities assigned to the Aerospace FFRDC. Changes in Aerospace FFRDC responsibilities may arise due to changes in program plans, priorities, or when significant changes in Aerospace FFRDC funding and STE allocations occur. Revisions are prepared and coordinated in the same way as are the original TO&Ps and are numbered in sequence to facilitate identification and reference.

c. General System Engineering and Integration (GSE&I).

(1) To assure the effective performance of General Systems Engineering and Integration (GSE&I), the Aerospace Corporation will designate a Systems Engineering Director or Principal Director (herein after referred to as Aerospace Director) for each program for which the FFRDC

is assigned a GSE&I role. The Aerospace Director will act on behalf of the Aerospace FFRDC in discharging its contractual responsibility to the Air Force. These activities are defined more specifically in the applicable TO&P prepared in accordance with paragraph 5.b. The schedule and support level for individual tasks will be based on the program priorities and requirements as agreed with the Air Force (or other government) Program Director.

(2) The activities of the Program Director and Aerospace Director will be closely coordinated. While the Aerospace FFRDC works principally in technical areas, the Program Director will provide, when appropriate, access to cost and schedule data, and pertinent information on management actions.

(3) The Aerospace Director, within the agreed upon allocation of GSE&I resources, will exercise initiative in technical areas and provide timely identification of all reasonable alternatives. The Aerospace Director will provide in writing a thorough, complete and competent analysis of the system engineering aspects of the program in order to provide a sound basis for selection, decision and (where appropriate) implementation of technical direction by the Air Force. The Aerospace Director will keep the Air Force Program Director informed of his current activities regarding plans for future Aerospace FFRDC work, results of technical reviews, contractor performance, and technical recommendations. The Aerospace Director will review and evaluate specified critical documents and provide written concurrence and recommendations.

(4) When applicable, the Aerospace Director will be accountable to appropriate SMC management for launch readiness in concert with the cognizant Aerospace Corporation Vice President who has been delegated the responsibility for independent launch readiness verification.

(5) Aerospace technical support for launch and flight test operations at field locations requires close coordination among co-located support groups, between the field organization program manager as well as the Aerospace FFRDC project engineer assigned to this facility as well as with the Program Director and the Aerospace Director at SMC.

d. Technical Review (TR).

(1) To assure the effective performance of Technical Review (TR) in accordance with the requirements of the applicable paragraphs of the AF/Aerospace contract, the Aerospace FFRDC will designate a Project Engineer for each Government contract for which the Aerospace FFRDC is assigned TR responsibility. These activities are defined more specifically in the applicable TO&P prepared in accordance with paragraph 5b.

(2) The activities of the Government Project Manager Officer and the Aerospace FFRDC Project Engineer will be similar to those outlined in paragraph 5c(2) and (3), as applicable to the assigned TR tasks.

e. Technical Support.

(1) To assure the effective performance of Technical Support in accordance with the requirements of the applicable paragraphs of the AF/Aerospace contract, the Aerospace FFRDC will designate a Director or Project Engineer, as appropriate for each of the designated roles. These activities are defined specifically in the applicable TO&P prepared in accordance with Paragraph 5b herein.

(2) The activities of the Project Manager/Officer and the Aerospace Director/Project Engineer will be similar to those outlined in paragraph 5c(2) and (3), herein, as applicable to the assigned tasks.

f. Meetings. In the performance of its assigned technical functions the Aerospace FFRDC shall participate in meetings with contractors as follows:

(1) The Air Force may request that the Aerospace FFRDC be present at Technical Direction Meetings and other formal meetings in which the Air Force plans to direct the contractors or resolve a matter using the result of technical work done by the Aerospace FFRDC. Such meetings are scheduled and chaired by the Air Force in accordance with a plan coordinated with the Aerospace FFRDC.

(2) The Air Force may invite Aerospace FFRDC representatives to attend management meetings with contractor officials that are held for discussion of the conduct of the contractual efforts.

(3) In carrying out the tasks of General Systems Engineering and Integration, Technical Review, or other contractually required technical functions, the Aerospace FFRDC, with prior approval of the Air Force, will establish and participate in Technical Interchange Meetings (TIMs) for the purpose of exchanging technical information with contractors and subcontractors.

(4) When appropriate, the Aerospace FFRDC will be invited to participate in meetings with higher headquarters and other DoD agencies.

g. Technical Comments and Recommendations.

(1) The Aerospace FFRDC comments and recommendations for modification, realignment or redirection of a contractor's effort will be submitted in writing to the Air Force Program Director or Project Officer outlining the reasons for the recommendation and defining the proposed change in appropriate form to facilitate the Air Force's decision regarding implementation.

(2) The Program Director or Project Manager/Officer will review the potential effects of the Aerospace FFRDC technical comments and recommendations on the project and review decisions with the Aerospace Director or Project Engineer, if appropriate, after taking into consideration all relevant factors.

(3) If the Aerospace Director or Project Engineer believes that the Air Force technical decision is not in the best interest of the program, the Air Force Program Director or Program Manager will be informed and a higher level Aerospace management review with the Air Force will be requested. Implementation of the decision may, at the Air Force Program/Project Manager's discretion, be withheld pending the review. If not otherwise resolved, ultimate referral will be made to the SMC Commander (or appropriate PEO) and the President of The Aerospace Corporation. The Commander's decision will be final. In the event that agreement is not reached

at this level, the Aerospace FFRDC will document its recommendations for inclusion in the SMC official Aerospace FFRDC contract file.

h. General Responsibilities.

(1) SMC is solely responsible for communications with other organizations within the Air Force, with other Governmental agencies, and with SMC contractors in matters related to their areas of responsibility. The Aerospace FFRDC may, in the exercise of its technical responsibility, communicate and discuss technical matters with the Air Force, other government agencies, SMC contractors, and other technical organizations. The Aerospace FFRDC may also review correspondence relating to the activity with the Air Force prior to transmittal of such correspondence. To assure proper technical coordination, the Air Force will inform the Aerospace FFRDC, when appropriate, of all technical correspondence to SMC contractors prior to issuance.

(2) For Aerospace FFRDC presentations to SMC elements, including the SMC Commander, the Aerospace FFRDC may select subjects and speakers as desired, contingent upon prior coordination with the cognizant program office. However, when the Aerospace FFRDC participates with SMC program offices in presentations to higher levels within the Air Force, or to entities outside the Air Force, speakers and presentation material will be approved by the cognizant program office. This restriction applies since the presentations of Aerospace FFRDC personnel may be interpreted as representing the position of the SMC Commander. Additionally, all Aerospace FFRDC presentations or papers that are to be given to entities outside SMC and which were prepared under the SMC/Aerospace contract must be reviewed and approved by the appropriate SMC element. For unclassified presentations, papers, or foreign release, the SMC Office of Public Affairs (PA) is the review/approval authority. For classified presentations or papers, the SMC Directorate of Security (AXP) is the review/approval authority. Similar rules apply for Non-SMC work with other AF or DoD programs.

i. Access to Cost Data.

(1) The basic factors as to determination of cost acceptability and cost negotiation with contractors are the sole responsibility of the Air Force (government), and the Aerospace FFRDC will not be held responsible in any way for these activities. However, to the extent that Air Force may lawfully do so and where the information provided is not derived from contractor cost proposal data involved in any ongoing source selection (unless specific access is authorized by the SMC (or other government) Source Selection Authority (SSA), SMC or other users of the Aerospace FFRDC will provide the Aerospace FFRDC with only that contractor cost information necessary to accomplish technical evaluation and tradeoff studies as required for performance of its technical responsibilities.

(2) The Aerospace FFRDC will respect the confidential nature of all contractor cost information furnished by the Air Force or other government users in accordance with the conflict of interest clause, AFSC FAR Sup. 52.209-9101. The Aerospace FFRDC will not disclose any such data outside the area of its contract responsibilities, duplicate, or use such data in whole or in part for any purpose other than in the performance of its technical responsibilities as set forth in its contract.

j. Source Selection.

(1) Source selection activities and review of proprietary data/information are the responsibility of the Air Force (government). Aerospace as a corporation or as an FFRDC does not participate in source selection. However, in support of this function and to the extent that applicable laws and regulations permit, the Air Force or other government users may call upon the Aerospace FFRDC to provide employees as independent technical consultants on specific technical questions and to advise in the solution of specific technical problems.

(2) All requests for source selection consultants or assistance will be by letter to the appropriate Aerospace General Manager or Operations Vice President, outlining the special assistance required. Such requests will be signed either by the Source Selection Evaluation Board Chairman, the cognizant SMC Program Director, or other appropriate point of contact.

(3) Designated Air Force (other government users) and/or contractor material pertaining to a source selection activity will be reviewed and/or evaluated from a technical standpoint by Aerospace FFRDC personnel within the confines of the designated meeting room(s) of the Source Selection Board and shall remain in the meeting room(s) as working papers of the Air Force Source Selection Board. Any signed technical data or reports prepared by Aerospace FFRDC personnel will be preserved by the Air Force (other users) in the respective Source Selection Record and, in case of need, will be made available to the President of Aerospace in accordance with AFR 70-15 [correct document?].

k. Periodic Reviews of Task Performance. The following are the Aerospace FFRDC periodic reviews to components of the Space and Missile Systems Center, other Air Force organizations, other DoD organizations, as well as non-DoD organizations having cognizance over Aerospace FFRDC support.

(1) The Aerospace FFRDC shall provide System Program Offices, Divisions, Project Offices with a formal monthly review by means of an oral briefing, an annotated briefing book, or a written report, as specified by the responsible office or division. Material to be covered includes Aerospace FFRDC tasks performed in the reporting period, technical accomplishments, technical issues and recommendations, expenditures of Aerospace FFRDC effort, current period and cumulative Aerospace FFRDC costs versus budget, forecast run out rates, plans for the next reporting period and critical events. Documentation provided will be retained by the responsible office for a minimum of one year.

(2) The Aerospace FFRDC shall provide the 2-letter chiefs or equivalent program directors with a formal semiannual summary review by means of an oral briefing, an annotated briefing book, or a written report, as specified by the responsible organization. Items to be covered include summaries of tasks performed by the Aerospace FFRDC in the reporting period, technical accomplishments, technical issues, expenditures of Aerospace FFRDC effort, current period and cumulative Aerospace FFRDC costs versus budget, forecast run out rates, plans for the next

reporting period and critical events. Documentation provided will be retained by the responsible office for a minimum of one year.

(3) The Aerospace FFRDC shall provide the SMC Command Section an annual summary review of all FFRDC activities by means of an annotated briefing book or an oral briefing to the Commander, Space and Missile Systems Center or his designee. Material to be covered includes summaries of Aerospace FFRDC tasks performed in the reporting period, technical accomplishments, technical issues, expenditures of Aerospace FFRDC effort, current period and cumulative Aerospace FFRDC costs versus budget, forecast run out rates, plans for the next reporting period and critical events. Documentation provided will be retained by the Chief Engineer.

(4) The SMC Chief Engineer shall insure that the appropriate level of reporting is being provided to all Aerospace FFRDC users by the responsible Aerospace FFRDC performing organization.

1. Space Utilization and Provision of Certain Support Functions. In accordance with Annex 5 which covers policy and procedures on the mutual use of office space between Air Force Space and Missile Systems Center and other Aerospace FFRDC user personnel and Aerospace FFRDC personnel:

(1) SMC Base Support to the Aerospace FFRDC and Aerospace Facility Support to SMC is described in the AF/Aerospace contract and is consistent with Annex 5.

(2) The Systems Program Office and the corresponding supporting Aerospace FFRDC technical organization, where applicable, will be located in reasonable proximity to the maximum extent practicable.

(3) Space will be allocated to the Aerospace FFRDC and the Air Force on an equitable basis, recognizing the designed site configurations of the Aerospace-owned and the Government-owned buildings.

m. Security and Emergency Actions.

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SMC FFRDC USERS GUIDE

Agreements between SMC and The Aerospace Corporation relating to security and emergency actions are coordinated between the Chief, Security Police Division, SMC, and the Director, Security and Safety, The Aerospace Corporation.

OFFICIAL

ROGER G. DeKOK, Lt Gen, USAF
Commander

SUMMARY OF CHANGES

This revision updates organizational titles and nomenclature, policy and responsibilities, reporting requirements, AF/SMC-Aerospace MOUs, coordination process, AFSCR 70-3 direction and terminology, and Technical Objectives & Plans (TO&P) requirements/preparation instructions. Non-DoD, FFRDC Direct Contract Processes, The Commercial Direct of Contract Process, Performance Evaluation, Surveillance Procedures, and non-FFRDC activities. Annexes were added that were separate policies and procedures to collect all Aerospace management agreements into a single guide.

- Annex 1 Air Force Space and Missile Systems Center (SMC) Procedures for Allocation of Resources of the Aerospace FFRDC Among DoD Agencies
- Annex 2 FFRDC Tasks/Roles
- Annex 3 Process Instruction to Place FFRDC Work on the Aerospace Corporation FFRDC Contract
- Annex 4 Process Instruction to Place Non-DoD FFRDC Work on Direct Contract with the Aerospace Corporation
- Annex 5 Procedures to Govern the Mutual Use of Office Space Between the Air Force Space and Missile Systems Center and Other Aerospace FFRDC User Personnel and the Aerospace Corporation FFRDC Personnel
- Annex 6 Enabling Clause for General Systems Engineering and Integration
- Annex 7 Process Instruction to Obtain Approval of Commercial Work by The Aerospace Corporation
- Annex 8 Process Instruction for Performance Evaluation
- Annex 9 Process Instruction for Aerospace FFRDC Contract User Surveillance
- Annex 10 Department of Defense Federally Funded Research and Development Center (FFRDC) Management Plan
- Annex 11 Non-FFRDC Activities

**AIR FORCE SPACE AND MISSILE SYSTEMS CENTER (SMC) PROCEDURES FOR
THE ALLOCATION OF RESOURCES
OF THE AEROSPACE FFRDC AMONG DoD AGENCIES**

Purpose: The purpose of this Annex is to outline the process to allocate FFRDC resources (MTS/STE) to the users of the Aerospace Corporation Contract.

I. Definitions. For the purpose of this Annex, the following definitions will apply:

a. Responsible Officer (RO): The Commander, SMC/CC. Aerospace DoD ceiling allocations are under control of the Responsible Officer.

b. DoD Agencies: Departments of the Army, Navy and Air Force, Office of Assistant Secretary Defense (OASD) (1), (OASD) (T), Director Defense Research and Engineering (DDR&E), Defense Nuclear Agency (DNA), Defense Investigation (DIA), Defense Information System Agency (DISA) Defense Mapping Agency (DMA), Advance Research Projects Agency (ARPA), National Security Agency (NSA), and Office of Joint Chiefs of Staff (OJCS), Space Command, Space Architects Office and the Under Secretary of Defense for Space (USD Space).

c. Agency Focal Point: A specific office designated by the DoD Agency as the single point of interface between the agency and the Air Force on all matters pertaining to support from the Aerospace FFRDC.

d. SMC Focal Point for Aerospace FFRDC Matters: The contract management office (AXC) at SMC shall serve as the focal point between DoD agencies and the Chief Engineer, SMC, with respect to Aerospace FFRDC contractual matters. All communications from DoD agencies relating to support from the Aerospace FFRDC will be addressed to SMC/AXC.

e. FISCAL Year: The Fiscal Year for budgeting purposes shall be the Federal Fiscal Year, that is, 1 October through 30 September. (The Aerospace FFRDC contract will coincide with the Fiscal Year.)

f. Baseline Program: The final allocation of Aerospace FFRDC STE is approved by the RO to commence the Fiscal Year.

g. Members of the Technical Staff (MTS): An MTS is a professional scientist or engineer actively and directly engaged in performing development planning, system engineering, research and experimentation, or technical support. Individuals are designated as MTS by the corporation. The Staff Year of Technical Effort (STE) is the basic unit of measurement for stating technical support requirements of the MTS.

II. Mission. SMC plans and manages the acquisition of space systems, together with related hardware and software, and supports the launch and flight test of space systems for DoD and other federal agencies. In furtherance of this mission, SMC supports the space command operations to develop and maintain space launch, tracking and support facilities, provides satellite launch, tracking, data acquisition, command and control; and develops advanced technology to support future space missions. The Aerospace Corporation is chartered as a California nonprofit corporation. Its primary purpose is to operate a Federally-Funded Research and Development Center that provides technical support in these areas and to support operational systems. Through its contract with SMC for the operation of the Aerospace FFRDC, it aids the United States Air Force in applying the full resources of modern science and technology to the achievement of qualitatively superior military space systems. This support assists with the creation of and choice of space systems concepts and architectures; the specification of technical space systems and subsystem requirements and interfaces; the development of and acquisition of space systems hardware and software; the testing and verification of performance; the integration of new capabilities and continuous improvement of system operations and logistics; and the technical formulation, initiation, and evaluation of space programs and activities undertaken by firms in the for-profit sector supporting the Air Force. After a development program is initiated, the Aerospace FFRDC supports the Air Force through technical review, monitoring and steering of industry efforts, consistent with the economical and timely accomplishment of program and mission objectives. The Aerospace FFRDC ensures that technical deficiencies and weaknesses are isolated and that the impact of new data, new developments, and modified requirements on total

systems concepts, technical performance, and cost and schedule are properly assessed and that appropriate changes are promptly introduced.

III. Policy. The DoD policy designates the U.S. Air Force as the sponsor of the FFRDC operated by The Aerospace Corporation. The cognizant DoD component is responsible for establishing review procedures to insure that DoD work undertaken by the Aerospace FFRDC does not exceed the dollar ceiling level approved by OSD/DDR&E and to insure that such work meets the criteria described herein. The Aerospace FFRDC represents a valuable but limited resource which exists primarily to support the mission of SMC and other AF/DoD organizations working on space systems.

IV. Formulation of Fiscal Year Program. The determination of STE requirements is a coordinated effort at several levels of SMC and Aerospace FFRDC's management. The following is how the MTS requirements are established and coordinated. The approval process is described as well as the estimating factors that are considered.

a. The Coordination and Approval Process:

(1) SMC/AX: Issues request to SMC Two-Letter Offices and all other MTS users of the current fiscal year contract for follow-on fiscal year's requirements. Also sends requests to potential new users.

(2) Two-Letter Office and Other Users: Reviews and submits requirements on AFSC Form 1640 for the follow-on fiscal year to SMC/AX.

(3) SMC/AX: Reviews and consolidates all inputs. Provides a copy of the consolidated requirements to the Aerospace FFRDC's management for review and assessment.

(4) Aerospace FFRDC: Aerospace FFRDC management reviews consolidated requirements. Provides comparative analysis to SMC/AX including basis for the Aerospace FFRDC recommendation.

(5) SMC/AX: Reviews with SMC Two-Letter Offices the comparative analysis and finalizes Two-Letter Offices' requirements. Informs the Aerospace FFRDC of requirements. Does similar review of other users

(6) Aerospace FFRDC: Advises, as necessary, on the viability of estimated MTS deliveries and associated risk considerations.

(7) SMC/AX: Prepares the fiscal year Aerospace FFRDC support requirements briefing and presents to SMC/CC-CV.

(8) SMC/CC-CV: Makes decision regarding MTS.

(9) SMC/AX: Briefs appropriate higher level decision makers.

(10) SMC/AXC: Negotiates, awards and administers contract with The Aerospace Corporation for the operation of the Aerospace FFRDC.

b. Adjustment to STE Requirements: Due to program requirement changes or changing space systems priorities, the Aerospace FFRDC STE support requirements may increase or decrease by program. All changes are reviewed/approved by the SMC Chief Engineer's Office and communicated to Aerospace via the PCO (SMC/AXC).

(1) Changes to programs sponsored by a SMC Two-Letter Office that do not increase the total Aerospace FFRDC MTS support to a SMC Two-Letter Office can be authorized by the Two-Letter Office and communicated to SMC/AX.

(2) Changes that increase support to a SMC Two-Letter Office must be justified and presented to SMC/AX for approval. SMC/AX should try to satisfy the increase by shifting MTS resources amongst Two-Letter Offices, if possible. If the net sum of the increase is within 1% of the total Aerospace FFRDC support, SMC/AX can approve the change. However, if the net change is greater than 1%, approval must be obtained from SMC/CC.

(3) Changes to programs within the SMC contract, excluding non-DoD sponsored programs, but not sponsored by an SMC Two-Letter Office are submitted to SMC/AX for review and if the net sum increase falls within the SMC/AX approval authority, SMC/AX can approve the change. However, if the increase is greater than the approval authority of SMC/AX, approval must be obtained from SMC/CC.

(4) Changes to non-DoD programs within the SMC contract are submitted to SMC/AX for review. Approval must be obtained from SMC/CC or his/her designee.

V. Roles and Criteria for Allocation of FFRDC MTS Support:

a. Major Areas of Support. This section provides basic guidelines regarding the roles assigned to the Aerospace FFRDC in providing technical and scientific support to DoD programs.

(1) Core Competencies. Core competencies encompass technical and scientific support areas that Aerospace can provide and which are listed below and further described in Annex 3, Attachment 2.

- (a) Launch Certification
- (b) Systems of Systems Engineering
- (c) Systems Development and Acquisition
- (d) Process Implementation
- (e) Technology Application

(2) Core Functions. The tasks which the Aerospace FFRDC may perform are encompassed by the following list of Core Functions which are further described in Annex 3, Attachment 3.

- (a) Acquisition Planning, Preparation, and Evaluation
- (b) Systems Architecture Planning and Development
- (c) Technical Performance Analysis and Assessment
- (d) Independent Technical Analysis
- (e) Operational Requirements Analysis and Evaluation
- (f) Integration Management
- (g) Risk Assessment and Management
- (h) Modeling and Simulation

- (i) Proof-of-Concept Prototyping
- (j) Program, Milestone, and Design Reviews
- (k) Technology Requirements, Applications, and Research
- (l) Trade Studies
- (m) Test Planning, Execution, and Analysis
- (n) Acquisition Process Improvements
- (o) Test Review and Witness
- (p) Mission and Threat Analysis
- (q) Independent Testing
- (r) Readiness Reviews
- (s) Laboratory Testing
- (t) Monitoring Launch Vehicle and Satellite Processing and Certifying Launch Readiness
- (u) Sustaining Engineering
- (v) Program Systems Engineering
- (w) Multi-Program Systems Engineering.

Basic Considerations:

- (1) Any determination to assign work to the Aerospace FFRDC must be preceded by an assessment demonstrating that an organic or non-FFRDC organization cannot meet the cognizant program office's technical requirements. The use of the Aerospace FFRDC will be restricted to selected important projects and programs which are consistent with its assigned mission, require its particular capabilities, and conform to the policy criteria for DoD use of federally-funded research and development centers set forth below.
- (2) The Aerospace FFRDC will not enter into formal competition with profit-making industrial contractors or with universities who could perform the required effort, nor will it engage in the commercial production of hardware/software.
- (3) The Aerospace Corporation will be responsible for contractually authorized work. The Aerospace Corporation will not be tasked contractually or otherwise to provide individuals for assignment and/or direction by the user in contravention of the statutory prohibition against

personal services (5th U.S.C. Section 3109). It will manage STE resources to accomplish specific tasks in accordance with the Contracting Officer's direction.

(4) The Aerospace FFRDC roles and responsibilities on each project or program will be clearly defined and documented in the approved contractual statement of work and supporting documentation.

FFRDC TASKS/ROLES

Purpose: The purpose of this Annex is to define the technical tasks categories and roles appropriate for the Aerospace Corporation FFRDC. Tasks are found in Section A-C and the roles are covered in Section D.

A. General Systems Engineering and Integration (GSE&I) Tasks**I. Systems Studies:**

(1) Perform engineering analyses and design studies to determine the system parameters and operating concepts necessary to meet evolving military objectives. Recommend feasible options, provide support in the selection process, and conduct trade-off studies, as requested, leading to a system definition.

(2) Refine the selected system design by performing design analyses, feasibility studies, studies of trade-offs among and within subsystems, cost effectiveness studies, system safety analyses, trajectory studies, including random reentry definition studies, of system operation, and preparation of mission profiles. Recommend definitions of subsystems, subsystem performance requirements, and major interfaces.

(3) Review current military operational objectives and recommend updating the system definition as necessary in consonance with contractor inputs and internal studies and analyses.

(4) Perform studies and investigations to resolve critical technical systems and subsystems problems.

(5) Define requirements for tracking and ephemeris determination for all phases of flight including launch and orbital operations.

- (6) Perform studies and investigations to define requirements for flight test and orbital operations including plans and procedures, contingency plans and procedures, operations support training and rehearsals, and in-flight tests.
- (7) Perform analyses and design studies to determine requirements and implementation concepts for data processing and simulation.
- (8) Perform design and verification analyses, including the development of feasibility software, to establish functional characteristics for computer hardware and software.
- (9) Perform technical analysis of the environmental impact of the operation of systems under development.
- (10) Perform analyses of total quality management applications to system design, manufacturing and other phases of program.
- (11) Prepare technical portions of briefings as indicated by program requirements. Make technical presentations as required by the Air Force.

II. Work Statement and Proposal Evaluation:

- (1) Prepare and recommend inputs to technical portions of Requests for Proposal (RFPs), including specifications, special provisions in proposal preparation instructions, evaluation criteria and technical standards for source selection.
- (2) Review RFP packages, including Statements of Work and other technical procurement material and recommend approval or change.
- (3) Review and advise the appropriate SMC/DoD Source Selection officials on technical portions of contractor's proposals, as requested. Review technical portions of unsolicited proposals, as requested.

(4) Assist in preparation of technical portions of Statements of Work and, as required, provide technical inputs to the Air Force for its use in the negotiation of definitive contracts.
Recommend inputs to the Contract Data Requirements List (CDRL).

III. Specifications and Top-Level Program Documentation:

- (1) Prepare an outline of the program specification requirements, including the Specification Tree.
- (2) Prepare and update, as required, the Systems/System Segment Specification(s).
- (3) Prepare a recommended list of required technical documents.
- (4) Assist in the preparation of the technical portions of all documentation required by the Air Force and DoD regulations for the purpose of obtaining program approvals, supporting the ASP and DAB processes, and supporting program reviews.
- (5) Participate in the preparation and update of technical requirements for program documents such as The General System Test Plan, the Program Requirements Document, the Orbital Requirements Plan, the Recovery Requirements Document, the Orbital Support Plans, the Test Range Planning Estimate, and Operations Requirements (OR) Document.
- (6) Participate with other Government agencies and test range agencies in preparing their top level program documentation.
- (7) Establish criteria for program standard and SMC preferred parts, review specifications for non-standard parts, and provide technical recommendations for parts specifications and procurement.

IV. Technical Development:

- (1) Prepare and maintain a master schedule of major technical events for the top level system(s) and major system segments.
- (2) Participate in preparation, maintenance, integration, and evaluation of system/system segment, equipment and computer program technical development milestone schedules, indicating critical dates for task accomplishment.
- (3) Identify those program events and reports (tests, reviews, accident risk assessments, audits, documents) considered of particular importance which require written review, evaluation and recommendations by Aerospace. Provide and maintain a schedule document including those program events.
- (4) Identify elements of the program which can be used in contractor schedule flow charts or schedule networks to insure the proper integration of contracted effort to total program effort. Review and evaluate contractor schedules for proper integration.
- (5) Recommend and maintain system reliability goals. Where feasible a stated confidence level will be associated with each reliability value requiring demonstration. Recommend apportionment of the reliability budget among system segments.
- (6) Recommend and maintain system significant performance parameters, e.g., CEP budget, range, launch vehicle performance, system/system segment weight, payload performance characteristics, ground support system performance characteristics, etc. Review equipment development status and determine the impact on system capability, effectiveness, etc.
- (7) Recommend parameters and a methodology for subsequent evaluation of contractor technical performance which is consistent with performance and/or performance incentive provisions of contractors contracts. This responsibility does not extend to the determination or payment of incentive or award fees, which remains the sole prerogative of the Air Force.

V. Technical Meetings:

(1) In conjunction with the Air Force, initiate Technical Interchange meetings as necessary. When Air Force personnel do not participate in meetings, provide results and recommendations to the Air Force.

(2) Participate, in a technical supporting role, at Technical Direction Meetings, Program Status Reviews, Design Reviews, Configuration Audits, Progress Report Meetings and other meetings having significant technical content. Provide technical support at Management Meetings at the request of the System Program Director.

(3) Participate in establishing and operating technical working groups such as Interface, Performance, Activation, System Safety, and System Test.

(4) Provide technical support at Air Force meetings and/or briefings with higher headquarters and DoD or outside agencies, as requested.

VI. Review and Evaluation of Critical Documents: Review and evaluate the following program documents for compliance with contractual requirements and mission objectives and provide written concurrence and/or recommendations.

(1) Critical contractor documents such as the Program Plan, Systems Effectiveness Program Plan (Reliability, Parts, Materials and Processes Manufacturing, and Quality Assurance), System Safety Program Plan and Support Equipment Development Plan.

(2) Contractually required program documents such as the General System Test Plan, the Program Requirements Document, the Orbital Requirements Document, the Recovery Requirements Document, the Test Range Planning Estimate, the System Test Objectives, and the Range Safety Report.

(3) Contractually required system/system segment and equipment design specifications; requirements, detail design and test specifications including data processing and software specifications, interface control specifications, and other specifications for contractually

deliverable Configuration Items as well as specifications at least one level below those for the Configuration Item, on a selected basis.

(4) Contractor-prepared specifications and procedures for critical non-deliverable equipment, facilities, support equipment, test equipment and all software, both diagnostic and delivered flight tapes.

(5) Contractually required technical reports and documents necessary for system evaluation and general systems engineering.

(6) Ground test plans and test procedures including development, qualification, acceptance, pre-flight readiness, and countdown tests.

(7) Contractor prepared flight test and orbital support plans and procedures including those for training exercises and operations support.

(8) Results of design reviews, audits, and readiness reviews and manufacturing and quality assurance audits.

(9) All Class I engineering change proposals. Determination as to the need for, or extent of, compensation required is the responsibility of the Air Force.

(10) Results of field hardware tests and test data required for flight.

VII. Review and Evaluation of Contractor System Design and Analysis: Conduct in-house tasks as noted and review and evaluate for compliance with contractual requirements the following contractor activities and documents and provide comments and recommendations in writing.

(1) Results of contractor studies and analyses.

(2) Contractors' schematics and product designs of equipment to insure adherence to program requirements.

(3) Contractors' analyses and designs for data processing and software to insure adherence to program requirements.

(4) Contractor prepared guidance equations, trajectory calculations, and orbital programs. Prepare, when appropriate, and maintain reference trajectories, and submit to the Air Force for utilization by the contractor.

(5) Contractors' analyses and designs for safety considerations, including hazard analysis, accident risk assessments and compliance with applicable criteria pertaining to launch vehicle interfaces, random reentry, nuclear explosive ordnance, facility siting and occupational safety and health.

(6) Contractors' functional analysis data and integrated system functional analysis.

(7) Design data for support equipment, operational ground equipment, test equipment, facilities, and software.

(8) Contractors' design of The Personnel Subsystem

(9) Contractors' reliability predictions and failure modes and effects analyses for accuracy and completeness.

(10) Contractor or Program Office prepared Life Cycle Cost/Design to Cost Models for accuracy. Prepare system-peculiar mathematical models when appropriate. (Contractor prepared Life Cycle Cost/Design to Cost trade studies, models, will be cataloged and retained for inclusion in the SMC corporate memory.)

(11) Technical Requirements for support and test equipment, facilities and software. Recommend support options when appropriate.

(12) Contractor analyses of structural dynamic loads, structural margins, stability and control, integrated mass 83 properties and analyses of aerothermal design.

(13) Validate contractors' vehicle hardware models against the analytical models used for design and analysis.

(14) At the direction of the program office and in accordance with the Commander's Policies, conduct independent analyses such as loads, flight controls, stability, etc. to verify the adequacy of the contractors' predictions and designs.

VIII. Review of Contractor Technical Performance: Review the following activities and record to insure contractor compliance with technical requirements of the contract.

(1) Perform in-plant review of contractor and subcontractor technical programs such as development, acceptance and qualification tests, system safety and reliability and quality assurance programs, after coordination with the Air Force Program Office.

(2) Review contractor and subcontractor in-plant activities. practices, and procedures including development, fabrication, assembly, test and piece parts processing and control, after coordination with the Air Force Program Office.

(3) Review the conduct of tests, witness critical tests, and evaluate test data for selected development tests and all acceptance, qualification and readiness tests.

(4) Participate in Configuration Item acceptance activities.

(5) Participate in design reviews and technical audits.

(6) Review equipment build-up at the contractors' and subcontractors' facility including mock-ups, qualification models, and engineering test models.

- (7) Review development and performance of support equipment, supporting test equipment, and facilities.
- (8) Review the progress and performance of relevant data processing equipment, and test and operations software.
- (9) Review contractor activity in support of field tests, flight tests, and orbital operations.
- (10) Review and evaluate the schedule status of hardware and software development, and equipment fabrication.
- (11) Participate in Parts, Materials, and Processes Control Board activities. Conduct independent tests of parts and materials when requested by the program office.
- (12) Review and evaluate the following contractor activities and supporting documents for compliance with contractual requirements and provide comments and recommendations in writing:
 - (a) Acceptance, Qualification and Readiness Tests.
 - (b) Configuration Items acceptance activities.
 - (c) Formal Design Reviews.

IX. Integration and Configuration and Interface Control:

- (1) Review the interfaces between system segments to insure proper integration of all system elements. Advise the Air Force as to the integrity of the integration efforts. Recommend means for exchange of appropriate data between the associate contractors involved.
- (2) Review the interface between system segments to assure integration of these system segments with the launch facilities.

- (3) Provide technical support to the Configuration Control Board and Interface Control Working group(s).
- (4) Provide technical support to SMC in site activation and provide representation to the Activation Working Group.
- (5) Participate in identifying and maintaining the functional requirements for the flight vehicle ground support system including tracking telemetry and command system, to insure the appropriateness of the program peculiar support systems and the compatibility of the vehicle with the ground equipment.
- (6) Participate in planning for Program Management Responsibility Transfer (PMRT).
- (7) Support post PMRT activities for residual tasks and directed upgrades.

X. Flight Test and Operations:

- (1) Develop a list of the flight test documentation necessary to satisfy Program and Range requirements in coordination with the appropriate range or agency and identify and recommend the preparation responsibility.
- (2) Provide field technical and flight operations support including pre-launch, Launch, post-launch, and orbital operations. Monitor orbital performance and provide alternative/contingency plans as appropriate.
- (3) Perform analysis and evaluation of selected flight test data; e.g., Launch Reports, Orbit Reports, Recovery Reports, as required for system evaluation. Prepare Flight Test Engineering Analysis Reports for each flight.
- (4) Prepare the Range Safety Report utilizing contractor inputs, or prepare technical requirements for the latter, and make technical analyses in support of range safety issues.

- (5) Provide technical support to failure analysis activities, and provide representation to the Failure Analysis Working Group.
- (6) Provide technical support to the Launch Operations and Orbital Operations Support Technical Advisor Staffs. Coordinate and evaluate the technical planning and operations activities for test operations at the Consolidated Satellite Test Center (Onizuka AFB) and Consolidated Space Operations Center (Falcon AFS).
- (7) Monitor and evaluate flight test preparations and test mission conduct, state of adequacy of support facilities and equipment, and status of Mission Systems. Review and evaluate vehicle command activity, anomalies, and corrective action.
- (8) Review test requirements, plans and procedures and provide written concurrence, comments and recommendations. Participate in mission planning; recommend telemetry test, and command generation, and other software modification; and support operations training and rehearsal activities.
- (9) Review the Launch Test Directive, the Orbital Support Plan, and other critical operations documents and provide written concurrence, comments and recommendations.
- (10) Prepare, for Air Force approval, System Test Objectives documents, or provide technical requirements for the latter, for each flight test, utilizing contractor inputs.
- (11) Participate in the activities for Program and Independent Readiness Reviews (IRR). Provide a co-chairman for the IRR team.
- (12) Provide technical expertise to the Air Force during the conduct of Failure Review Boards and accident investigations.

B. Technical Review Tasks

This is the process of appraising the technical performance of contractors. Technical Review is inherently part of General Systems Engineering and Integration (GSE&I). Tasks performed in the

process of Technical Review are included in categories IV through IX of the ten basic categories of GSE&I listed in Part A of this Annex. Technical Review is accomplished through meetings, exchanging information on progress and problems; reviewing reports; evaluating presentations; reviewing hardware and software; witnessing and evaluating tests; analyzing plans for future work and evaluating such efforts relative to contract technical objectives; and providing comments and recommendations in writing to the Air Force Program Manager as an independent technical assessment for use in consideration of modifying the program or redirecting the contractor efforts to assure timely and economical accomplishment of program objectives.

C. Technical Support Tasks

I. Selected Research, Development, Test and Evaluation (SRDT&E)

Perform research, development, test, and evaluation activities for which the Aerospace FFRDC is uniquely qualified because of the availability of specially qualified personnel, special facilities, or background information obtained in support of other Air Force activities.

II. Plans and System Architecture (P&SA)

Provide space system development planning support to SMC and other DoD agencies to provide future effective and secure military space systems that will satisfy user operational requirements. The development planning function includes: near term integrative planning support for SMC and other DoD agencies studies and planning for the evolution of current systems, as well as ad hoc studies of current issues in support of SMC and other DoD agencies; systems architecture that will provide a time phased plan for meeting the development goals; and systems planning that will define initial system characteristics for future space systems. This effort includes the definition of system requirements and concept definition; specification of system characteristics and overall system definition; and cost/benefit studies for new or modified systems and inter-operability considerations.

III. Mission-Oriented Investigation and Experimentation (MOIE)

Develop experimental and test capabilities and execute multi-program systems enhancement tasks critical to support the SMC and other DoD agency acquisition processes as well as perform analytical and experimental investigations in the sciences and technologies critical to space and space-related systems. The results of these investigations and the capabilities and experience developed by this effort will be used in the identification of system technology needs, new system designs, acquisition of future systems, and elimination of problems and constraints associated with current systems. Oversight management is the responsibility of SMC/AX.

IV. Multi-Program Systems Enhancement (MPSE)

Provides team action in performing horizontal systems engineering and integration involving ground, launch, space and support systems within SMC. Included under this category are: efforts to review, analyze, develop and disseminate critical information in the areas of multi-systems engineering, engineering policy and resources, technical lessons learned, reliability, maintainability, standardization, interoperability, radiation hardening, parts engineering, parts policy, testing, Industrial Modernization Incentive Program (IMIP), productivity, manufacturing, quality assurance, life cycle cost, design-to-cost, value engineering, systems engineering, integrated logistics, support equipment analysis, documentation resource analysis, computer resources, transportability, human factors engineering, electromagnetic compatibility, systems security, and other areas involved in the systems acquisition support process; the tracking of program failures, anomalies and corrective actions; risk assessment, identification of risk trends, and recommendations for future risk avoidance; maintenance of appropriate databases; and acquisition training support.

Multi-program engineering tasks generally in support of SMC staff organizations are also included in this task area. Each task area will be assigned to the appropriate organization for management oversight.

V. Engineering Methods (EM)

Perform studies to facilitate the utilization and development of new/improved analytical techniques and other engineering tools applicable to space systems design, development, cost estimating, and the evaluation of new technologies and techniques for present and future space systems.

VI. International Technology Assessment (ITA)

Provide foreign technology data and intelligence and threat analyses to SMC and other DoD agencies in support of their planning and development efforts. This activity shall provide supporting analytical and evaluation programs and techniques, and provide detailed evaluations, studies, and presentations resulting from the exploitation and analysis of applicable foreign scientific and technical data.

D. Aerospace FFRDC Roles:

(1) System Acquisition

(a) System Engineer. In this role the Aerospace FFRDC executes general system engineering activities and assumes responsibility for the technical performance of the system within the prescribed parameters and system operational requirements. It will provide the lead source of technical initiative and provide the principal technical interface with the industrial contractors, including review and evaluation of such contractors' technical performance. It will provide continuity through the system by preparation of the appropriate system specifications and assist the Air Force in formulation of technical direction during subsequent engineering, production, implementation, and test phases. It will also function to insure the technical integrity of the system. For Air Force programs, FFRDC 033 General System Engineering/Technical Direction functions are outlined in the AFSC 800 series publications on Systems Management.

(b) Subsystem Engineer. When the system engineer or corresponding responsibilities are otherwise assigned, Aerospace may be assigned a role of subsystem engineer with responsibility for the engineering of a specific subsystem or subsystems of the total system. As subsystem

engineer their role and responsibilities will be similar to those discussed under the system engineer role with appropriate restrictions to match the scope of the subsystem(s).

(c) Task Engineer. When the system engineer or corresponding responsibilities are otherwise assigned, the Aerospace FFRDC may be assigned responsibility for a specific task (or tasks) in support of a program or project. In this role of task engineer, its responsibilities may include (but are not limited to):

1. Preparation of specifications or plans.
2. Serving as consultants in the evaluation of technical proposals, plans, or progress.
3. Preparation of test specifications and test documents.
4. Test supervision or direction.
5. Analysis and/or evaluation of technical problems or deficiencies.
6. Monitoring, guiding, or directing specified contractor activities.

(d) Application of System Acquisition Roles. The normal role for the Aerospace FFRDC in the systems acquisition will be that of system engineer. The assignment of a task engineer role must be considered as an exceptional case, and the appropriateness of assigning such a role will require special justification.

(2) Development Planning.

(a) The Aerospace FFRDC provides Development Planning (including systems research and planning) on advanced systems concepts and participates in related analyses and studies leading to proposals for the next generation of system or system improvements. In this role, the Aerospace FFRDC supports mission analyses, analyses of operational requirements, feasibility studies and

experiments, planning studies, system cost/effectiveness studies, intelligence analyses, and preliminary system designs.

(b) The Aerospace FFRDC may be assigned the responsibility for specific advanced planning studies, system analyses, or the preparation of the technical portion of planning documents, i.e., Program Management Plans and Technical Development Plans.

(3) Research and Experimentation.

(a) The Aerospace FFRDC carries out specific research and experimentation programs which have as their objectives:

1. The provision of significant contributions to state of the art relating to their respective mission areas.

2. The maintenance of competence in those fields of technology necessary to support efforts in the areas of Systems Acquisition and Systems Research and Planning.

(b) The Aerospace FFRDC will perform this role, either as independent projects or as an essential part of the systems engineer role, when research or experimentation is fundamental to technology or design determinations, in either techniques or systems for planning or acquisition of space systems.

(4) Technical Support.

(a) The Technical Support role involves analysis and evaluation of specified and selected technical aspects of a problem that fall within their particular competence, provision of specialized consulting services or the cooperative use of specialized facilities.

(b) Efforts in this area are assigned only when it is determined that such participation will provide a unique competence essential to fulfillment of the specific program objectives.

The Basic Considerations in paragraph V.b above apply.

PROCESS INSTRUCTION TO PLACE FFRDC WORK ON THE AEROSPACE CORPORATION FFRDC CONTRACT

1. The purpose of this Annex is to outline the procedures to request, approve, and place FFRDC work from both DoD, non-DoD and non-profit organizations on The Aerospace Corporation FFRDC contract through the Technical Objective & Plan (TO&P) process. Each year, SMC/AX issues two support “Calls” (Spring Call and Fall Call) to organizations requesting such support for the next Fiscal Year. The Spring Call is issued in February and Fall Call is issued in July. The data collected during the Spring Call is used to validate requirements for the next fiscal year and to obtain SAF/AQ approval of those requirements. The data collected during the Fall Call is used to revalidate the requirements and to place the efforts on contract for the next fiscal year.

2. Because of intense scrutiny by Congress, OSD, DDR&E, the Defense Science Board, and SAF/AQ of FFRDCs, the following procedures must be followed by all organizations requesting Aerospace FFRDC support. The Decision Tree For Task Allocation (Atch 1) is a flow chart of the certification process for FFRDC tasks. Each task on the TO&P will be reviewed by the requesting government official and the SMC Chief Engineer to determine if it is proper work for an FFRDC.

a. Is the Task a proper FFRDC task: Is this work the government organization really needs performed by an FFRDC? Is the task properly prepared in the Scope of Work section on the Technical Objectives and Plans (TO&P) Form?

b. Can the task be performed by organic resources?

c. Is the Task DDR&E Core Work (Attachment 2)? Is the Task one or more of the permitted SAF/AQ FFRDC Core Functions (Attachment 3)?

d. Is the Task justified as a sole source effort using one or more of the eleven AFMC sole source criteria in Annex 3. (Attachment 4)?

e. Can industry (e.g. a SETA company) perform the work and meet the criteria? If so, an FFRDC is precluded from doing the work.

3. To certify the above process, each requesting, government program official must sign the following certification statement. This statement must be included on each TO&P (see Para 4.a below):

I certify that the positions (MTS) I am requesting from The Aerospace Corporation have been reviewed according to the following steps:

1) I have reviewed the work to see if it is work that actually needs to be done. I have then analyzed the work to see if it could be done by organic resources, industry at large, or SETAs. I certify that only the FFRDC can do this work.

2) I have reviewed the Sponsoring Agreement and have determined that the following criteria

are applicable justification for sole source work:

[See “SMC FFRDC Users Guide, Annex 3” (Attachment 4) and list by number any of the eleven AFMC Sole Source criteria that are applicable to this TO&P].

3) I certify that the work falls within the DDR&E definition of Core Work for an FFRDC: It is within the Aerospace mission, it uses the DDR&E Aerospace Core Competencies, and it complements the strategic relationship between the Air Force and the Aerospace FFRDC. In addition, all the tasks fall within the SAF/AQ FFRDC Core Functions.

Signature Block and Signature

4. In order to implement the above procedures, each request for Aerospace FFRDC support must include the following documents:

a. A completed Technical Objectives & Plans Form (SMC Form 1640) (Attachment 5). Each TO&P must be signed by both the requesting government official and a representative of The Aerospace Corporation. Each TO&P must identify each of the FFRDC tasks (see SMC FFRDC Users Guide, Annex 2) that Aerospace will perform. Use the SMC “Technical Objectives and Plans (TO&P) Preparation Instructions” (Attachment 6) and the sample TO&P (Attachment 7) as guides.

Each TO&P must include the requesting government official’s certification statement noted in Paragraph 3, above.

b. An MTS Level Of Effort Estimate. [See Format at Attachment 8]. This is an estimate of the MTS required to support each task listed in the TO&P “Scope of Work.” A correlation between this MTS estimate and the FFRDC tasks (SMC FFRDC Users Guide, Annex 2) specified in the TO&P must be apparent in your documentation.

c. An Aerospace MTS/Funding Summary. [See Format at Attachment 9]. This summary identifies the funds projected for the effort. Do not submit MTS requirements estimates in excess of funding projections.

d. A Five Year MTS Forecast of MTS requirements. [See Format at Attachment 10].

e. An Estimation of MTS Usage on Each SAF/AQ Core Function (Attachment 3). [See Format at Attachment 11]. This is an estimate of the MTS which will be used on each of the SAF/AQ FFRDC Core Functions (Attachment 3) into which the requesting official certifies all TO&P work falls (See above Para 3, Certification Statement).

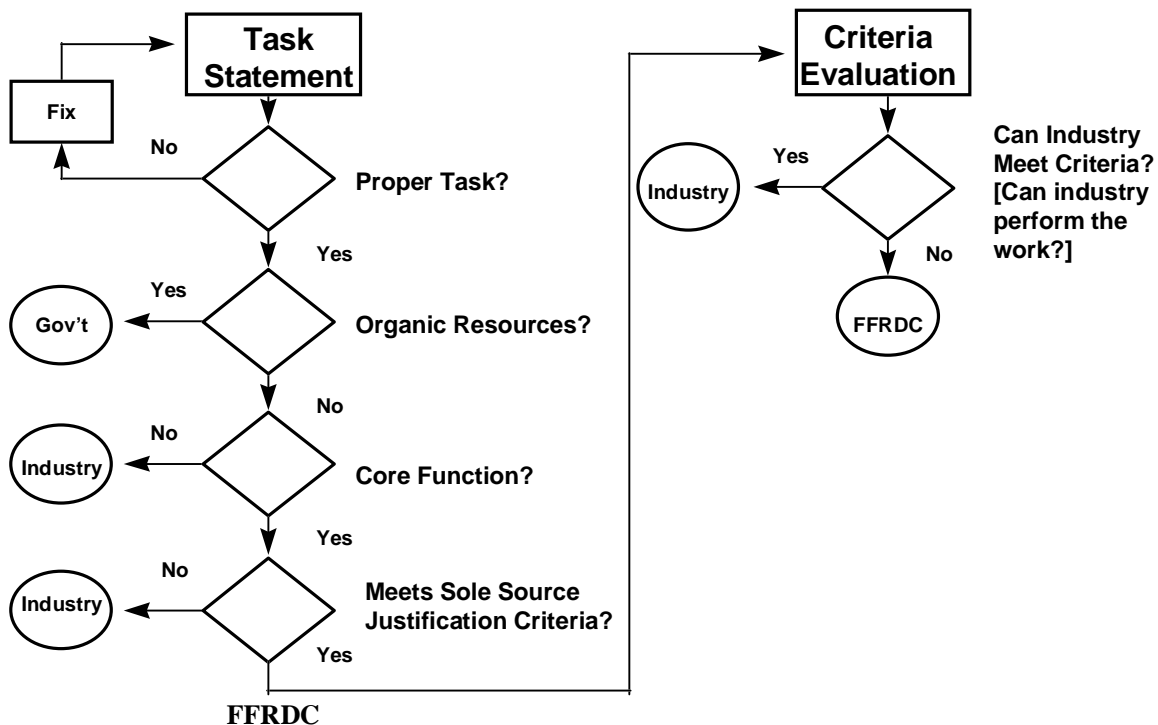
f. An AFMC Sole Source Criteria Justification. [See Format at Attachment 12]. This is a listing of the eleven AFMC Sole Source criteria found in Attachment 4 that justify a sole source effort on the TO&P. AFMC requires the requesting government official to use these criteria, such as “Freedom from bias” and “Need for state-of-the-art information,” to justify the Aerospace effort requested on the TO&P.

5. A copy of SMC FFRDC Users Guide (a revised version of the former SSDR 800-8) is available from SMC/AXC. An example SMC/AX Spring Call task letter is at Attachment 13.

13 Attachments

1. Decision Tree for Task Allocation
2. DDR&E Core Work for FFRDCs (Core work & Core Competency Definitions)
3. SAF/AQ FFRDC Core Functions
4. Eleven AFMC Sole Source Justification Criteria
5. SMC Form 1640 (TO&P Form)
6. SMC Form 1640 (TO&P Form) Preparation Instructions
7. Sample TO&P SMC (Filled Out)
8. Format for MTS Level of Effort Estimate
9. Format for MTS Funding Summary
10. Format for Five Year MTS Forecast
11. Format for Estimation of MTS Usage on Each SAF/AQ Core function
12. Format for AFMC Sole Source Criteria Justification
13. Sample SMC/AX Spring Call task letter

Decision Tree for Task Allocation



DDR&E CORE WORK FOR FFRDCS: Core Work & Core Competency Definitions for Aerospace

This paper describes the character of the core work conducted by the Aerospace Corporation's systems engineering Federally Funded Research and Development Center (FFRDC)--hereafter referred to as the Aerospace FFRDC--sponsored by the United States Air Force. (Reference: DDR&E document dated December 1, 1995 entitled Federally Funded Research and Development Centers Core Definition Statements and Program Review).

Core work is defined as that which is appropriate for the Aerospace FFRDC in pursuit of Aerospace's mission and charter to support the USAF, and in light of the strategic relationship maintained between the Aerospace FFRDC and the USAF. This systems engineering work is: (1) consistent with the Aerospace FFRDC's mission, purpose, and capabilities; (2) consistent with the USAF's need for Aerospace FFRDC support as reflected by the core competencies that the Aerospace FFRDC maintains; and (3) consistent with the FFRDC special relationship with the USAF.

Aerospace Mission

The Aerospace Space mission is to support the USAF. The mission involves applying the full resources of modern science and technology to achieve continuing advances in military space and space related systems which are basic to national security; to provide the USAF's space efforts with an organization which is objective, possesses high technical competence, and is characterized by permanence and stability; to provide a vital link between the U.S. Government and the scientific and industrial organizations in the country with a capability and an interest in the space field; and, through its unique role, to help to ensure that the full technical resources of the nation are properly applied to developing highly reliable and cost effective space and space related systems, and that the potential advances in the space field are realized in shortest possible time.

Aerospace Core Capabilities and Competencies

The Aerospace FFRDC Aerospace provides support not available from the USAF's in-house technical and engineering capabilities. This support assists with the creation of and choice of space system concepts and architectures; the specification of technical space system and subsystem requirements and interfaces; the development of and acquisition of space system hardware and software; the testing and verification of performance; the integration of new capabilities and continuous improvement of system operations and logistics; and the technical formulation, initiation, and evaluation of space programs and activities undertaken by firms in the for-profit sector supporting the USAF.

After a development program is initiated, the Aerospace FFRDC supports the USAF through technical review, monitoring and steering of industry efforts, consistent with the economical and timely accomplishment of program and mission objectives. The Aerospace FFRDC ensures that technical deficiencies and weaknesses are isolated, and that the impact of new data, new developments, and modified requirements on total systems concepts, technical

performance, and cost and schedule are properly assessed, and that appropriate changes are promptly introduced.

The Aerospace FFRDC provides two levels of systems engineering for space systems: (1) integration of subsystems and system segments into complete systems; and (2) the integration of each system into the overall system of all national security space systems, optimizing interoperability, performance, risk, resilience, and standardization. This integration process extends from initial engineering feasibility studies and conceptual design, through hardware development and operations to mission termination. It encompasses satellites, launch vehicles, ground systems, and their integration to meet total mission requirements.

The Aerospace FFRDC's capabilities are the result of the unique, long-term support relationship established with the USAF described above, and the ability of this support workforce to provide the following characteristics:

- broad and deep working knowledge of all aspects of space technologies, including commercial, USAF, civil, DOD, and international developed
- detailed knowledge of a broad array of space systems currently in use, being upgraded, or in development
- intimate familiarity with the application of the underlying engineering processes for architectures, acquisition, systems migration and operational test and evaluation
- thorough understanding of the operational role played by the overall space system
- widespread and substantial involvement with national security developers, users and fielders of space systems

The Aerospace FFRDC provides the following core competencies:

Launch Certification: The Aerospace FFRDC provides validation of in-line processing of flight hardware, analysis of projected range support, and formal certification of adequacy of processing and readiness for flight to support mission and launch reviews.

Systems of Systems Engineering: The Aerospace FFRDC provides the architecture planning and development, internal and external interface analysis, modeling and simulation analysis, and independent testing necessary to support the development of space systems.

Systems Development and Acquisition: The Aerospace FFRDC provides operational requirements analysis and evaluation, mission threat analysis, risk assessment, and technical performance analysis and assessment to support acquisition planning, program preparation and evaluation, test planning and evaluation, and program milestone and design reviews for all space systems.

Process Implementation: The Aerospace FFRDC provides technical expertise to support acquisition reform initiatives such as military specifications and standards reform, development and evaluation of critical processes, as well as to support proof-of-concept prototyping in support of space systems.

Technology Application: The Aerospace FFRDC provides state of the art assessments of technology opportunities, alternatives, and risks to support the application of new technology in current or developing space systems

Aerospace's Special Relationship with the United States Air Force

The special relationship between the USAF and the Aerospace FFRDC was established and is maintained to bring private sector expertise to the systems engineering efforts of the USAF that cannot be carried out as effectively by in-house or for-profit contractors. The special relationship has the following characteristics:

Objective, High-Quality Work. The Aerospace FFRDC is required to maintain an exceptionally competent staff and to produce consistently objective high-quality work.

Freedom from Real or Perceived Conflicts of Interest. The USAF requires the Aerospace FFRDC and The Aerospace Corporation to be independent of commercial, shareholder and other associations that could lead to real or perceived conflicts of interest.

Broad Access to Information. The Aerospace FFRDC 's work is fully informed by access to sensitive government information and to proprietary data from industry.

Comprehensive Knowledge of Sponsor Needs and Problems. The USAF requires the Aerospace FFRDC to maintain a comprehensive knowledge and expertise in the core areas described in this paper, providing corporate memory on long-term systems issues.

Long-Term Continuity. The special relationship between The Aerospace FFRDC and USAF was expected to be and has been long-term. The relationship was established and has been continuous since 1960.

Technical Link. The Aerospace FFRDC provides the technical link between the USAF space program and the other scientific and industrial organizations worldwide that affect the future of the national security space program.

Summary

Core systems engineering work is defined by the combination of Aerospace's mission; Aerospace's core capabilities and competencies; and the FFRDC special relationship maintained between Aerospace and the USAF. Aerospace conducts core work for the USAF, and other Department of Defense agencies. The Aerospace FFRDC does conduct core work for non-DOD entities when appropriate and when it is directly related to the core areas defined herein and when it is supportive of national security goals; this work is conducted subject to the review and

approval process described in Aerospace's Sponsoring Agreement and Space and Missile Center FFRDC Users Guide.

SAF/AQ FFRDC CORE FUNCTIONS
(Core Function Definitions)

1. **Acquisition Planning, Preparation, and Evaluation.** This includes support in preparation of solicitation documents (source selection plan, RFP, technical requirements documents, WBS, etc.) and provision of technical advisors to source selection. Specific activities include evaluation of the contractor's proposal and required documentation as requested by the Air Force to accomplish the requirements selection criteria for the system, subsystem or task.
2. **Systems Architecture Planning and Development.** Includes items such as broad concepts studies, systems opportunities, systems roadmaps and supporting technology roadmaps. Particular emphasis on "systems of systems" approaches and interoperability and joint operations. Create reference designs for purposes of analysis and program planning.
3. **Technical Performance Analysis and Assessment.** The continuing verification of the degree of anticipated and actual achievement of a technical parameter. Independent analysis/detection of design flaws and technology problems with resolution alternatives (physical process) tailored to program needs.
4. **Independent Technical Analysis.** Independent analysis of the technical performance or progress of a program, system, subsystem or component assessed against its technical or contractual requirements. Application of special knowledge and expertise to explicit operational problems. Other independent analyses such as system design, failure, problem detection and resolution, environmental impact assessments, monitoring, and abatement technology.
5. **Operational Requirements Analysis and Evaluation.** Iterative requirements analysis and flowdown with the customer. Matching program technical requirements with mission requirements. Resolution of conflicting requirements. Evaluation of the degree of mission accomplishment in either a simulated or planned operational environment
6. **Integration Management.** Independent analyses and evaluation of systems internal and external interfaces. As part of the systems of systems approach, it includes interaction among associated systems.
7. **Risk Assessment and Management.** The identification and analysis of potential problems in order to quantify and assess risks, and to implement or control the appropriate approach for handling each risk identified.
8. **Modeling and Simulation.** All hardware and software effort to model operational systems throughout system life cycle. Includes architecture and systems of systems modeling and simulation developments.
9. **Proof-of-Concept Prototyping.** Prototyping used in Demonstration and Validation and Engineering and Manufacturing Development to understand requirements and assist in identifying and reducing risk associated with emerging technologies, applications, and interfaces.
10. **Program, Milestone, and Design Reviews.** Includes all formal and informal technical reviews and milestones such as SDR, PDR, CDR, etc. These may be conducted incrementally or at major review points. Support includes review of deliverables, independent analysis as required and ATP recommendation. Includes reviews conducted to ensure the system is ready for its next phase of development.
11. **Technology Requirements, Applications, and Research.** State of the art assessments. Assessment of technology opportunities. Technology alternatives and risk assessments

versus program needs. Selective, specialized, in-depth analysis and state of the art improvement in critical, system technologies. Mission oriented investigation and experimentation (MOIE). Evaluations of the application of available technology to development programs.

12. **Trade Studies.** Analyses conducted to evaluate trade-offs among stated user requirements, design, program schedule, functional performance requirements, and life cycle cost.
13. **Test Planning, Execution and Analysis.** Review of the contractual requirements to support the tests which will verify that system end items satisfy their specification requirements. Review of procedures, pass-fail criteria, test articles, and test configuration. Independent analysis as required. Assessment of manufacturing process integrity and changes. Assessment of first of a kind repairs.
14. **Acquisition Process Improvements.** Efforts necessary to support both Acquisition Reform initiatives (such as Military Specifications and Standards Reform), and interoperability.
15. **Test Review and Witness.** Reviews conducted to evaluate the completeness of the execution of test requirements for systems and sub-assemblies. Independent verification of test integrity and validity.
16. **Mission and Threat Analysis.** Analysis of existing and potential missions as well as existing and potential threats to support the development of products and processes for operational use. Independent analysis and exploitation of intelligence products for systems. Threat assessment packages tailored to program life cycle needs.
17. **Independent Testing.** In-house conduct of the hardware and software testing to verify and validate test concepts, procedures, and methodologies.
18. **Readiness Reviews.** A variety of independent reviews used to ensure that the configuration item or system is either ready for testing, ready for production at the completion of Engineering & Manufacturing Development, or in the case of space systems, launch, mission, or system operations
19. **Laboratory Testing** Tests conducted to explore or verify performance(e.g., that a prototype is ready for entry into Engineering And Manufacturing Development)
20. **Monitoring Launch Vehicle and Satellite Processing and Certifying Launch Readiness.** Validation of in-line processing of flight hardware. Adequacy of projected range support. Formal certification of adequacy of processing and readiness for flight. Additional support to mission and launch readiness reviews.
21. **Sustaining Engineering.** Engineering inputs to fix or improve operations and maintenance capability for existing systems or proposed architectures. System design for supportability.
22. **Program Systems Engineering.** Includes requirements development, systems engineering planning, and establishing and supporting process for integration of requirements flowdown, performance, and design alternatives. Analysis and insight into subsystem and system design and integration, requirements flowdown, design, performance and cost trades.
23. **Multi-Program Systems Engineering.** Horizontal engineering between programs, lessons learned, technology commonality and other items. As part of the systems of systems approach it includes interaction among associated space systems. Includes independent analysis and evaluation of system interfaces and functions as required to assure system integrity and reliability.

AFMC SOLE SOURCE CRITERIA JUSTIFICATION
“Criteria to Determine if a Given Program
Should Be Assigned to the Aerospace Corporation”

Criteria to Determine if a Given Program Should Be Assigned to the Aerospace Corporation: The following criteria have been established by AFMC as factors in determining if the circumstances are appropriate for assigning an effort to Aerospace. requests for aerospace support must include justifications which describe how these criteria are applicable to the program seeking support. Although some of the following eleven (11) criteria may overlap, they are described individually for clarity and to indicate a relative order of importance.

(1) Freedom from Bias due to Predilection for Design, Hardware and Software, or Approach. It is important to the DoD that objectivity be retained in design, choice of off-the-shelf hardware and software, choice of hardware from competing contractors, selection of hardware as influenced by possible subsequent production opportunities, preparation of specifications, etc.. a hardware or software producing company is likely to have a predilection for a particular design or product, or a particular manufacturing or management approach. Where such a company has to make a choice between competing contractors, bias is difficult to eliminate.

(2) Need for State-of-the-Art Information from Government Laboratories and Universities. A task may require extensive knowledge of the state-of-the-art as developed in universities, government laboratories, etc.. such knowledge, of course, is available to industry but is not necessarily used since industry tends to specialize in particular fields of interest consistent with its best competitive position. Assignment of the task to industry or to Aerospace could be governed by the extent to which applicable knowledge of the state-of the art is to be found in these sources.

(3) Extent of Access to DoD Planning Information. A broad need-to-know is requisite to the execution of advanced planning and integration of proposed systems with existing systems. Extensive and complex integration of requirements, and close liaison with systems users, is necessary in the early conceptual studies, initial analyses, and design stages leading to program definition or acquisition. Bringing individual contractors for the different projects into conceptual planning, and extending general access across DoD programs would, except under unusual circumstances, give the contractors an unfair advantage over competitors because of information gained on programs related to the one on which the contractor performed. On the other hand, too broad a restriction on procurement eligibility may make the contractor reluctant to participate in the planning role. However, if the task is not unduly complex and can be well defined to minimize access to such planning information, and if procurement restrictions are acceptable, the task may be given to industry.

(4) Extent of Access to Intelligence. Multiple projects, involving many individual contractors would require the wide dissemination of such information. To avoid charge of favoritism, access would have to be granted to all contractors having the capability to bid. Providing this intelligence to Aerospace, however, limits its distribution within reasonable bounds and permits technical support consistent with, and fully evaluated in terms of long range plans and goals, and other sensitive information.

(5) Need for Industry Proprietary Information. Proprietary data concerning designs, manufacture and processes are very important to industry. Contractors are reluctant to part with proprietary data necessary for interface management to a contractor who is studying or advising on a

system for a procurement agency. Where such needs for proprietary data are minimal, or where problems concerning access to such data are not significant, this criterion could be of minor importance. Where the problems are serious, and the interface complex, Aerospace can lessen proprietary problems materially.

(6) Access to Industry Proposals. Some tasks require review of industry proposals, reduction of data contained in a common base, and selection of the best approaches. It is generally inappropriate to give planning or program definition studies, or contractor proposals, either unsolicited or in response to invitations, to industry for technical evaluation. Industry should not have access to this information nor be involved in establishing technical criteria involved in decision making.

(7) Need for Extensive Background Information. Some tasks require drawing heavily on previous experience or background that any one industrial concern could not normally have unless it had participated in a number of programs to the exclusion of other contractors.

(8) Need for Diversified Skills. The task requirements may require extensive diversified special skills not readily available to any one contractor. It may be necessary to maintain inordinate control over the contractor through the associate mechanism. Where management problems for the associate contractors are minimal, industry could be qualified to meet this criterion.

(9) Need for Outstanding Specialists in Specific Fields. For certain tasks, one or more state-of-the-art considerations may be of overriding importance, and the whole project may hinge on the availability of technical competence in a specified field. Such competence may exist uniquely at aerospace by virtue of its primary program mission and the cross-feed of information and experience and knowledge among similar programs. However, industry may also have such outstanding specialists, and where this situation exists, appropriate tasks should be assigned to industry, not to aerospace simply because they are convenient. In such cases, Aerospace may perform in a subsystem or research and engineering role.

(10) Continuity of Effort. Continuity of effort on a single system from conceptual and advanced planning through initial system engineering and specification provides a degree of design coherency and consistency that cannot be obtained as effectively in any other way. It may not be desirable to involve industrial contractors under these conditions because of the difficulty in maintaining continuity without giving unfair competitive advantages, or unwarranted access to intelligence data.

(11) Need for Large Special Facilities. Some tasks require specialized facilities. Obviously such installations cannot be provided to all contractors interested in bidding on a program and making such facility available to any one contractor would give unfair competitive advantage. Duplication would not be in the Government's best interest.

SMC Form 1640

TECHNICAL OBJECTIVES AND PLANS - FY 1997				
TITLE		TO BE COMPLETED WHEN ISSUED		
		J.O. NUMBER(S)	DATE	SECTION
CONTRACT NUMBER F04701-93-C-0094	CATEGORY		ISSUE Original	PAGE 1 OF 2 PAGES
INSTRUCTIONS (See Attachment 3, SDR 800-8) 1. <u>Program Objectives:</u> 2. <u>Program Management:</u> 3. <u>Aerospace Corporation Responsibility:</u> 4. <u>Contractors:</u> 5. <u>Scope of Work:</u>				
PROGRAM/PROJECT OFFICE COORDINATION				
AIR FORCE SPO/AGENCY/REPRESENTATIVE (Signature & Date)		AEROSPACE PROGRAM/PROJECT OFFICE (Signature & Date)		
MUTUAL AGREEMENT AND APPROVAL FOR PUBLICATION/DISTRIBUTION				
AIR FORCE CONTRACTING OFFICER (Signature & Date)		THE AEROSPACE CORP (Signature & Date)		

SMC Form 1640, JUL 95

REPLACES AFSC FORM 1640, OCT 85, WHICH IS OBSOLETE

TECHNICAL OBJECTIVES AND PLANS - FY 1997				
TITLE		TO BE COMPLETED WHEN ISSUED		
		J.O. NUMBER(S)	DATE	SECTION
CONTRACT NUMBER F04701-93-C-0094	CATEGORY		ISSUE Original	PAGE 2 OF 2 PAGES
INSTRUCTIONS (See Attachment 3, SDR 800-8)				
<p>6. <u>Special Requirements</u>:</p> <p>7. <u>Level of Effort</u>: The level of effort is as agreed to and recorded in the contract files of Aerospace and SMC.</p> <p>8. <u>Compliance with Regulatory Requirements</u>:</p> <p>I certify that the positions (MTS) I am requesting from the Aerospace Corporation have been reviewed according to the following steps:</p> <p>1) I have reviewed the work to see if it is work that actually needs to be done. I have then analyzed the work to see if it could be done by organic resources, industry at large, or SETAs. I certify that only the FFRDC can do this work.</p> <p>2) I have reviewed the Sponsoring Agreement and have determined that the following criteria are applicable justification for sole source work:</p> <p>3) I certify that the work falls within the DDR&E definitions of Core Work for an FFRDC, it is within the Aerospace mission, it uses the DDR&E Aerospace Core Competencies, and it compliments the strategic relationship between the Air Force and Aerospace. In addition, all tasks fall within the twenty-three (23) SAF/AQ FFRDC Core Functions.</p>				
PROGRAM/PROJECT OFFICE COORDINATION				
AIR FORCE SPO/AGENCY/REPRESENTATIVE (Signature & Date)		AEROSPACE PROGRAM/PROJECT OFFICE (Signature & Date)		
MUTUAL AGREEMENT AND APPROVAL FOR PUBLICATION/DISTRIBUTION				
AIR FORCE CONTRACTING OFFICER (Signature & Date)		THE AEROSPACE CORP (Signature & Date)		

SMC Form 1640, JUL 95 REPLACES AFSC FORM 1640, OCT 85, WHICH IS OBSOLETE

TECHNICAL OBJECTIVES AND PLANS (TO&P) PREPARATION INSTRUCTIONS

Each TO&P will include the following:

- a. **TITLE:** A short title of the program or activity.
- b. **PROGRAM OBJECTIVES:** A brief description of the Air Force's, (or other sponsoring agency's) broad objectives for the program or activity.
- c. **PROGRAM MANAGEMENT:** Identify SMC's or other organization's responsibility in managing this program. Reference any pertinent documents.
- d. **RESPONSIBILITY OF THE AEROSPACE CORPORATION:** Identify the category or categories of work for which Aerospace is responsible on the program or activity (GSE&I, TR, etc.). These are selected from the list of work categories embodied in the contract Statement of Work.
- e. **CONTRACTORS:** List contractors whose performance Aerospace must review.
- f. **SCOPE OF WORK:** The scope of Aerospace GSE&I work will be defined by citing SMC FFRDC Users Guide, Annex 2 and listing the tasks which require major emphasis. Specific exceptions will be stated. For other categories of work specific tasks, lists should be formulated using tasks from SMC FFRDC Users Guide, Annex 2, as applicable. The tasks should sufficiently define the work so that the responsible Air Force and Aerospace personnel can, within the normal working relationship, carry out their assignments. Terminology such as "as requested" shall not be used in the TO&P. Procedural, administrative or financial information shall not be included.
- g. **SPECIAL REQUIREMENTS:** List special requirements for reports, facilities, etc., if applicable.
- h. **LEVEL OF EFFORT:** Include the following statement: "The level of effort is as agreed to and recorded in the contract files of Aerospace and SMC."
- i. **STATEMENT:** The following certification statement must be included:

I certify that the positions (MTS) I am requesting from The Aerospace Corporation have been reviewed according to the following steps:

- 1) I have reviewed the work to see if it is work that actually needs to be done. I have then analyzed the work to see if it could be done by organic resources, industry at large, or SETAs. I certify that only the FFRDC can do this work.
- 2) I have reviewed the Sponsoring Agreement and have determined that the following criteria are applicable justification for sole source work:

[See "SMC FFRDC Users Guide, Annex 3, (Attachment 4) and list by number any of the eleven AFMC Sole Source criteria that are applicable to this TO&P].

3) I certify that the work falls within the DDR&E definition of Core Work for an FFRDC: It is within the Aerospace FFRDC mission, it uses the DDR&E Aerospace Core Competencies, and it complements the strategic relationship between the Air Force and Aerospace. In addition, all the tasks fall within the twenty three SAF/AQ FFRDC Core Functions.

Signature Block and Signature

TECHNICAL OBJECTIVES AND PLANS-FY1996			
TITLE Defense Support Program (DSP)		TO BE COMPLETED WHEN ISSUED	
		J.O. NUMBER(S) 1470	DATE March 28, 1996
CONTRACT NUMBER F04701-93-C-0094	CATEGORY GSE&I & TR	ISSUE	SECTION
		PAGE 1 OF 5 PAGES	
INSTRUCTIONS (See attachment 3, SAMSOR 800-8)			
<p>1. <u>Program Objectives.</u> The DSP objectives are to continue the planning, development, procurement and deployment of a classified multi-satellite, multimission military program that provides key real-time data to the National Command Authorities, Theater Commanders, and other users. The current system comprises satellites, dedicated fixed and mobile ground data processing centers, communications networks, software for systems operations, and training and development facilities.</p> <p>2. <u>Program Management.</u> The Air Force Materiel Command (AFMC)/Space and Missile Systems Center (SMC) is responsible for the system acquisition and test support and for participation in system turnover activity with the responsible operating command and for sustaining engineering throughout the system's life cycle. Space and Missile Systems Center is also responsible for the continuing efforts in accordance with Program Management Directive PMD 2362(2) for future development, system improvements, subsequent test and evaluation, and turnover of such improvements to the operating command. Priorities and schedules of Aerospace tasks, or additional tasks, will be established by mutual agreement between the Air Force manager and Aerospace prior to initiation of effort.</p> <p>3. <u>Aerospace Corporation Responsibility.</u> Aerospace will perform General Systems Engineering & Integration (GSE&I) and Technical Review (TR) as defined in SMC Regulation 800-8 for the Defense Support Program. Tasks will be selected by mutual agreement and will include but not be limited to the following:</p> <p>3.1 <u>Systems Engineering</u></p> <p>3.1.1 <u>Architecture and Integration:</u> Perform System of Systems analysis and evaluation of internal and external interfaces and functions to assure system integrity and reliability. Evaluate DSP transition plans, interfaces and procedures for supportability, interoperability and joint operations. Support the SPO in system test verification. Perform independent communications systems analysis and support transition frequency management and vulnerability assessments. Support ALERT, TES, and tactical user interface working groups. Maintain the Aerospace DSP joint processing facility, local area network and electronic interfaces with the SPO and SMC.</p> <p>3.1.2 <u>Plans and Requirements:</u> Coordinate and update user requirements and participate in system requirements analysis, functional analysis/flowdown and requirements data basing for SBIRS Increment I Ground Consolidation. Provide support for constellation replenishment studies, engineering specialties, survivability, test and evaluation. Conduct planning for transition from current to follow-on SBIRS elements. Provide on-site liaison with AFSPC in Colorado Springs for planning, requirements and operational activities.</p>			
PROGRAM/PROJECT OFFICE COORDINATION			
AIR FORCE SPO/AGENCY/REPRESENTATIVE (Signature & Date) Col. C. P. Weston, Systems Program Director		AEROSPACE PROGRAM/PROJECT OFFICE (Signature & Date) J. R. Parsons, General Manager	
MUTUAL AGREEMENT AND APPROVAL FOR PUBLICATION/DISTRIBUTION			
AIR FORCE CONTRACTING OFFICER (Signature & Date)		THE AEROSPACE CORP (Signature & Date)	

AFSC Form 1640, OCT 85

REPLACES SD FORM 10, AUG 77, WHICH IS OBSOLETE.

TECHNICAL OBJECTIVES AND PLANS - FY 1996			
TITLE Defense Support Program (DSP)		TO BE COMPLETED WHEN ISSUED	
		J.O. NUMBER(S) 1470	DATE March 28, 1996
CONTRACT NUMBER F04701-93-C-0094	CATEGORY GSE&I & TR	ISSUE	SECTION
		PAGE 2 OF 5 PAGES	
INSTRUCTIONS (See attachment 3, SAMSOR 800-8)			
<p>3.1.3 <u>Systems Trades and Analysis:</u> Evaluate system performance levels through analysis of empirical data and simulations. Sustain existing surveillance simulation analysis tools for evaluating system performance. Participate in special ad hoc studies as required. Support NTF wargaming activities as directed.</p> <p>3.2 <u>Satellite Production, Launch & Operation, Flight Readiness & Beacon Support.</u> Provide Satellite 23 production support with focus on top level review of spacecraft/sensor test results for compliance to program requirements. A technical representative will be provided at contractors' plants to facilitate exchange of technical information required to respond to SPO requests. Technical expertise will be provided, as requested by the SPO, to review technical issues. Provide support of launch activities and Early-On-Orbit Testing (EOT), including planning and participation as members of the Launch and EOT team (program office staff, ETG on-call only). Assist in reviewing EOT mission and State-Of-Health (SOH) data to provide the SPO with recommendations to 50th SW for declaring an Emergency Operational Capability (EOC) and for the acceptability of final EOT results. Provide the support for focal plane calibration employing the Aerospace beacon. Provide support, as requested by the SPO, to review and monitor satellite storage test anomalies, component trend data analysis, sensor thermal vacuum retests and sensor MWIR retrofit/testing activities. Interface with AFSPC on current mission events and support system problem resolution activities as required. Support the Anomaly Resolution Review Board for close-out of on-orbit anomalies. Provide members to the Satellite 18 Independent Readiness Review Team and support any SPO requirements for special reviews, such as flight or mission readiness reviews. Provide a written verification of Flight 18 Launch Readiness. Support Program Interface Control Working Group to ensure an effective interface between the satellite, booster and launch facility. Provide Satellite 23 integration and interface support for an alternate launch vehicle to establish satellite and ground support equipment design requirements. Perform auxiliary payload studies as requested by the SPO. Perform alternate Sat 23 launch vehicle studies as requested by the SPO. Provide support, as requested by the SPO, of contractors' Orbital Support Services and Sensor Engineering Support tasks.</p> <p>3.3 <u>Ground Systems</u></p> <p>3.3.1 <u>Current Strategic Ground Data System.</u> For the established elements of the ground data system that supports the strategic mission, evaluate performance and proposed changes in hardware, software, or operating procedures which will result in sustainment and any required product improvement. Monitor system performance, identify and resolve system</p>			
PROGRAM/PROJECT OFFICE COORDINATION			
AIR FORCE SPO/AGENCY/REPRESENTATIVE (Signature & Date) Col. C. P. Weston, Systems Program Director		AEROSPACE PROGRAM/PROJECT OFFICE (Signature & Date) J. R. Parsons, General Manager	
MUTUAL AGREEMENT AND APPROVAL FOR PUBLICATION/DISTRIBUTION			
AIR FORCE CONTRACTING OFFICER (Signature & Date)		THE AEROSPACE CORP (Signature & Date)	

TECHNICAL OBJECTIVES AND PLANS - FY1996			
TITLE Defense Support Program (DSP)		TO BE COMPLETED WHEN ISSUED	
		J.O. NUMBER(S) 1470	March 28, 1996
CONTRACT NUMBER F04701-93-C-0094		CATEGORY GSE&I & TR	SECTION
		ISSUE	PAGE 3 OF 5 PAGES
INSTRUCTIONS (See attachment 3, SAMSOR 800-8)			
<p>anomalies/problems, interface with the operator in the planning and coordination of the delivery and checkout of SPO deliverables. Participate in the conduct of or monitor system tests or other special tests as appropriate. Support ground segment Technical Interchange and other meetings.</p> <p>Support transition activities from the SRSU to the DSES contract and provide Aerospace technical assistance as requested to SSSG/Det 1/Det 25 to investigate and provide problem solutions and sustainment of both hardware and software in the DSP Ground System. Maintain a small staff in Colorado to expedite the interface with AFSPC's operators and maintainers. Support SSSG sustainment activities and the transition of their developments into the operational sites. In support of SPO's satellite engineering responsibility, provide minimal on-site support at FAFB for anomaly resolution and early on-orbit checkout. Provide operational support for special SPO testing, contractor requests for data, and to the SBIRS site activation task force (SATF).</p> <p>Provide general Ground System Program Office and Engineering Technology support. Provide technical expertise for the Century Rollover effort to insure all DSP Ground Systems are YEAR2000 compliant. Support the DSP Consolidation effort and transition planning for the new SBIRS Ground Systems, particularly in areas involving external interfaces.</p> <p>3.3.2 <u>Talon Shield/ALERT</u>. In support of theater applications, appraise the technical performance of contractors, evaluate the performance of hardware and software, and analyze the operational capability relative to technical objectives. Accomplish selected research, experimentation, development test and evaluation tasks as required by the SPO. These may include defining ephemeris processing enhancements, undertaking fielding/test of unique algorithms, processing for false track rejection, and integrating Additional and Other sources. Support the Talon Shield/ALERT activities at the NTF.</p> <p>Support Special Activities which include, but are not limited to, special demonstrations, Theater Airborne Warning Systems (TAWs) support, joint TES exercises, TMD System Exerciser activities and developing/fielding laser beacons to evaluate the Central Tactical Processing Element's (CTPE's) capability and reduce sensor line-of-sight errors. Sustain the Aerospace laser beacon system.</p> <p>Support the planning for the transition of operations to the new ground stations for SBIRS. Participate in related acquisitions in a technical advisory capacity and/or prepare technically oriented RFP package components and other Technical documentation. Support source selection activities as required.</p>			
PROGRAM/PROJECT OFFICE COORDINATION			
AIR FORCE SPO/AGENCY/REPRESENTATIVE (Signature & Date) Col. C. P. Weston, Systems Program Director		AEROSPACE PROGRAM/PROJECT OFFICE (Signature & Date) J. R. Parsons, General Manager	
MUTUAL AGREEMENT AND APPROVAL FOR PUBLICATION/DISTRIBUTION			
AIR FORCE CONTRACTING OFFICER (Signature & Date)		THE AEROSPACE CORP (Signature & Date)	

TECHNICAL OBJECTIVES AND PLANS - FY 1996					
TITLE Defense Support Program (DSP)		TO BE COMPLETED WHEN ISSUED			
CONTRACT NUMBER F04701-93-C-0094		J.O. NUMBER(S) 1470	DATE March 28, 1996		
CATEGORY GSE&I & TR		ISSUE	SECTION		
		PAGE 4 OF 5 PAGES			
<p>INSTRUCTIONS (See attachment 3, SAMSOR 800-8)</p> <p>4. <u>Contractors.</u> DSP and Talon Shield/ALERT associate contractors and subcontractors include:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> GENCORP (Aerojet) Stanford Telecommunications Gulton, Inc. Harris Corporation Hughes, Irvine Loral Federal Systems, Boulder, CO Mission Research Corp. Raytheon Corporation TRW Hughes Silicon Graphics </td> <td style="width: 50%; vertical-align: top;"> Sensors, Ground Station Improvements, Integration & System Interfaces, and CTPP Link 1/2 Receiver and GCN Equipment Command & Telemetry Equipment Satellite & Ground System Electronics Antenna Modification Mobile & Transportable Ground System, LPS Software & Hardware (DSES contractor) Scintillation Phenomena Ground Communication Terminals (AMCT) Spacecraft, Satellite Integration, and CTPP CTPP Subcontractor CTPP Workstation Vendor </td> </tr> </table> <p>5. <u>Scope of Aerospace Work.</u> The work during FY'96 will conform to the tasks listed in SMC Regulation 800-8, Attachment 2, with the exception of Task IX 6 and 7 which deal with PMRT.</p> <p>6. <u>Special Requirements.</u> None identified.</p> <p>7. <u>Level of Effort.</u> The level of effort is as agreed to and recorded in the contract files of Aerospace and Air Force Material Command, Space and Missile Systems Center.</p> <p>8. <u>Compliance With Regulatory Requirements.</u></p> <p style="margin-left: 40px;">I certify that the positions (MTS) I am requesting from the Aerospace Corporation have been reviewed according to the following steps:</p>				GENCORP (Aerojet) Stanford Telecommunications Gulton, Inc. Harris Corporation Hughes, Irvine Loral Federal Systems, Boulder, CO Mission Research Corp. Raytheon Corporation TRW Hughes Silicon Graphics	Sensors, Ground Station Improvements, Integration & System Interfaces, and CTPP Link 1/2 Receiver and GCN Equipment Command & Telemetry Equipment Satellite & Ground System Electronics Antenna Modification Mobile & Transportable Ground System, LPS Software & Hardware (DSES contractor) Scintillation Phenomena Ground Communication Terminals (AMCT) Spacecraft, Satellite Integration, and CTPP CTPP Subcontractor CTPP Workstation Vendor
GENCORP (Aerojet) Stanford Telecommunications Gulton, Inc. Harris Corporation Hughes, Irvine Loral Federal Systems, Boulder, CO Mission Research Corp. Raytheon Corporation TRW Hughes Silicon Graphics	Sensors, Ground Station Improvements, Integration & System Interfaces, and CTPP Link 1/2 Receiver and GCN Equipment Command & Telemetry Equipment Satellite & Ground System Electronics Antenna Modification Mobile & Transportable Ground System, LPS Software & Hardware (DSES contractor) Scintillation Phenomena Ground Communication Terminals (AMCT) Spacecraft, Satellite Integration, and CTPP CTPP Subcontractor CTPP Workstation Vendor				
PROGRAM/PROJECT OFFICE COORDINATION					
AIR FORCE SPO/AGENCY/REPRESENTATIVE (Signature & Date) Col. C. P. Weston, Systems Program Director		AEROSPACE PROGRAM/PROJECT OFFICE (Signature & Date) J. R. Parsons, General Manager			
MUTUAL AGREEMENT AND APPROVAL FOR PUBLICATION/DISTRIBUTION					
AIR FORCE CONTRACTING OFFICER (Signature & Date)		THE AEROSPACE CORP (Signature & Date)			

TECHNICAL OBJECTIVES AND PLANS - FY 1996			
TITLE Defense Support Program (DSP)		TO BE COMPLETED WHEN ISSUED	
		J.O. NUMBER(S) 1470	DATE March 28, 1996
CONTRACT NUMBER F04701-93-C-0094	CATEGORY GSE&I & TR	ISSUE	PAGE 5 OF 5 PAGES
<p>INSTRUCTIONS (See attachment 3, SAMSOR 800-8)</p> <p>1) I have reviewed the work to see if it is work that actually needs to be done. I have then analyzed the work to see if it could be done by organic resources, industry at large, or SETAs. I certify that only the FFRDC can do this work.</p> <p>2) I have reviewed the Sponsoring Agreement and have determined that the following criteria are applicable justification for sole source work:</p> <ol style="list-style-type: none"> 1. Freedom from Bias Due to Predilection for Design, HW & SW or Approach 2. Need for State-of-the-Art Information from Government Laboratories and Universities 3. Extent of Access to DoD Planning Information 4. Extent of Access to Intelligence 5. Need for Industry Proprietary Information 6. Access to Industry Proposals 7. Need for Extensive Background Information 8. Need for Diversified Skills 9. Need for Outstanding Specialists in Specific Fields 10. Continuity of Effort <p>3) I certify that the work falls within the DDR&E definition of Core Work for an FFRDC: It is within the Aerospace mission, it uses the Aerospace Core Competencies, and it compliments the strategic relationship between the Air Force and Aerospace. In addition, all the tasks fall within the twenty three SAF/AW FFRDC Core Functions.</p> <p>9. <u>Total Quality Leadership</u>. Support the implementation of Total Quality Leadership and Integrated Weapons Systems management philosophies by participating as a full partner with SPO personnel in strategic planning activities and as Integrated Product Teams (IPTs). The Aerospace organization will reflect a close customer/developer/supplier relationship.</p>			
PROGRAM/PROJECT OFFICE COORDINATION			
AIR FORCE SPO/AGENCY/REPRESENTATIVE (Signature & Date) Col. C. P. Weston, Systems Program Director		AEROSPACE PROGRAM/PROJECT OFFICE (Signature & Date) J. R. Parsons, General Manager	
MUTUAL AGREEMENT AND APPROVAL FOR PUBLICATION/DISTRIBUTION			
AIR FORCE CONTRACTING OFFICER (Signature & Date)		THE AEROSPACE CORP (Signature & Date)	

AFSC Form 1640, OCT 85

REPLACES SD FORM 10, AUG 77, WHICH IS OBSOLETE.

DSP MTS Estimate for Aerospace Support
FY '97 1 October 1996 - 30 September 1997

<u>Task</u>	<u>MTS (Baseline)</u>
3.1 <u>Systems Engineering</u>	
Plans & Requirements	1.75
Trades & Analyses	2.00
Architecture and Integration	4.75
System Liaison	0.25
Management	<u>0.50</u>
Subtotal	9.25
3.2 <u>Satellite Production, Flight Readiness, and Orbital Support</u>	
Sensor Production	1.5
Spacecraft Production	2.0
Launch Vehicle Integration	4.5
Satellite Ops and EOT	6.0
Independent Readiness Review	0.5
Beacon Tests	2.0
Sustaining Engineering	<u>3.0</u>
Subtotal	19.5
3.3 <u>Ground Segment</u>	
Ground Sustaining Engineering	4.0
SBIRS Transition	0.5
Interfaces and Integration	0.5
Talon Shield	4.5 (TS)
ALERT	3.0 (TS)
Special Tests/Activities	4.0 (TS)
NTF	1.5 (TS)
CISF	2.0
FAFB	1.5
Aurora	<u>2.0</u>
Subtotal	23.5
GRAND TOTAL	52.25

**FORMAT FOR MTS LEVEL OF EFFORT ESTIMATE
ORGANIZATION XXX****JON XXX (if known)****FYXX**

[Notional tasks & MTS; for example only]

<u>TASKS</u>	<u>MTS-years</u>
Advanced Planning	2.0
Space Warfare Center Support	3.5
System Development Support	4.0
System Engineering Integration	2.0
Communication Architecture Development	1.0
<u>Operations Support</u>	<u>0.5</u>
TOTAL	13.0

FORMAT FOR AEROSPACE MTS/FUNDING SUMMARY

Organization Name XXXX
Job Order Number (JON) XXXX

FYXX

[Notional data only]

Program Element Number	Program Element Title	Appropriation Type (Estimated)	Brief Description of Effort	MTS Level (Estimated)	MTS Funding Available
XXXXXXXXX	XXXXXX	3400	GSE&I SUPPORT	13.0	\$2,558,000

FORMAT FOR FIVE YEAR MTS FORECAST FOR FYXX

(Notional example for FY97)

ORGANIZATION XXXX

JOB ORDER NUMBER JON) XXXX

SUSTAINING OPERATIONS

	FY98	FY99	FY00	FY01	FY02
TOTAL MTS REQUESTED	2.0	2.0	2.0	2.0	2.0

FORMAT FOR ESTIMATION OF MTS USAGE OF EACH SAF/AQ CORE FUNCTION***ORGANIZATION XXXX****JOB ORDER NUMBER (JON) XXXX****SAF/AQ CORE FUNCTION**
(Notional example follows)**ESTIMATED MTS-years USAGE**

2	2.0
4	1.0
5	1.0
6	0.5
7	0.2
8	3.5
10	1.5
23	<u>1.0</u>

Total Usage 10.7 MTS-years

Directions:

1. List each SAF/AQ Core Function, by number only, that you determine is appropriate for assigning the effort to Aerospace (see Attachment 3).
2. List the estimated MTS you will use to accomplish each SAF/AQ Core Function.

* There are the twenty three SAF/AQ Core Functions into which the requesting official certifies all TO&P work falls. See SMC FFRDC Users Guide, Annex 3, Para 3, Certification Statement and Attachment 3.

ORGANIZATION XXXX

AFMC SOLE SOURCE CRITERIA JUSTIFICATION

(Notional Example Data)

Job Order Number (JON)	TITLE	CRITERIA (1-11)
xxxxx	System Development Support	1,2,4,8,7,9

Directions: For each Job Order Number (JON), list the criteria (numbers only) that are appropriate for assigning the effort to Aerospace.

Ref. SMC FFRDC Users Guide, Annex 1, Paragraph V.d. (See Attachment 4)

MEMORANDUM FOR AEROSPACE FFRDC CUSTOMERS

FROM: SMC/AX

SUBJECT: FY97 "Spring Call" Aerospace FFRDC Members of Technical Staff
(MTS) Support Requirements

1. I request that all organizations with a requirement to use Aerospace FFRDC MTS personnel, in FY97, document that requirement in accordance with SMC FFRDC Users Guide (the newly revised SSDR 800-8) and submit the documentation to SMC/AXC not later than 15 March 1996. Procedures to complete the documentation are outlined in the attachment to this letter.

2. As you may be aware, the Air Force's use of FFRDCs in general (and our use of the Aerospace FFRDC in particular) is undergoing intense scrutiny by Congress, OSD, DDR&E, the Defense Science Board, SAF/AQ, and other high-level organizations. This scrutiny has resulted in specific, detailed procedures which must be followed by SMC and each organization requesting Aerospace support. Therefore, in accordance with the attached procedures, please review your requirements and their justification carefully before you submit them.

3. Our timeline for SAF/AQ approval is still late April - early May. Therefore, I need to collect your top-level requirements soon. I request your assistance in completing this data call in a timely manner.

4. "Spring Call" inputs should be addressed to:

SMC/AXCA
Attn: Paul Kocincki
160 Skynet Street, Suite 2315
Los Angeles AFB, CA 90245-4683

5. Please direct any questions to Paul Kocincki at extension (310) 363-2533 or DSN 833-2533.
FAX: (310) 363-0084 or DSN 833-0084.

CHARLES E. WHITED, Colonel, USAF
Deputy Director for Program Management

Attachment
Procedures for the FY97 Spring Call

**PROCESS INSTRUCTIONS TO PLACE NON-DoD FFRDC WORK
ON SEPARATE CONTRACTS WITH THE
AEROSPACE CORPORATION**

I. PURPOSE.

a. The purpose of this Annex is to outline the procedures for Aerospace Corporation to request approval from SMC to contract for FFRDC work directly with non-DoD government entities, foreign government entities, and non-profit entities. (Note: Procedures for adding non-DoD work to the SMC FFRDC contract are described in Annex 3. These tasks will not use this annex but will follow the same process as DoD users of the SMC FFRDC contract). The FFRDC sole source justification is used for all these activities (See Annex 11 Figure 1).

b. The non-DoD, FFRDC work covered by this Annex includes support to the following organizations: U.S. Federal, State, and Local governments and their designated agents; foreign governments and their designated agents; universities; non-profit organizations including FFRDCs and other corporations. Commercial work is considered non-FFRDC work, the procedures to request Aerospace support for commercial companies are addressed in Annex 6 and Annex 11.

c. As noted in Annex 3, Attachment 2, the Aerospace Corporation mission is to support the USAF and to perform DDR&E Core Work. However, because the contract with the Air Force is negotiated annually and subject to the Congressional budget process and the DoD FFRDC allocation process, contractual continuity and stability, although desired, cannot be guaranteed. Therefore, the Air Force recognizes that non-DoD work can make a contribution to national security, can provide significant advantages to the U.S. Government, and can provide business stability to the Aerospace Corporation.

II. PROCEDURES.

a. The Decision Flow for Aerospace Non-DoD Direct Contract Proposals (Atch 1) is a flow chart of the approval process for non-DoD, direct contract efforts. All requests for such non-DoD work will be presented in accordance with the Template Of Supporting Information Needed To Approve Requests For Non-DoD Work (Atch 2). All requests will be requested via a transmittal letter (Atch 3).

b. US Government Entities, Other Government Entities, Not-For Profit Entities. Aerospace will request approval via a transmittal letter (See example at Atch 3) with supporting documentation provided according to the Template (Atch 2) to the SMC Chief Engineer (SMC/AX). The SMC Chief Engineer, or his designee, will evaluate the request based on the approval criteria noted below and will make an approval decision. The PCO and the Program Manager in AXC will sign and forward the decision to Aerospace.

c. Foreign Government Entities & Agents. Aerospace will request approval via a transmittal letter (See example at Atch 3) with supporting documentation provided according to the Template

(Atch 2) to SMC/AX. SMC Chief Engineer (SMC/AX), or his designee, will evaluate the request based on the approval criteria noted below and will forward a recommendation to the SMC Commander. The SMC Commander, or his designee, will review the recommendation and make a determination. The SMC Commander will forward the decision to the SMC Chief Engineer. The PCO and the Program Manager in AXC will sign and forward the decision to Aerospace.

d. **Approval Criteria.** The Decision Tree for Task Approval (Annex 3, Attachment 1) is a flow chart to apply the approval criteria noted below. Each request would be evaluated on its own merits but must satisfy the following criteria:

(1) Is the task a proper FFRDC task: Is this work the government organization really needs performed by an FFRDC?

(2) Can the task be performed by organic resources?

(3) Is the task DDR&E Core Work (Annex 3, Attachment 2)? Is the task one or more of the permitted SAF/AQ FFRDC Core Functions (Annex 3, Attachment 3)?

(4) Is the task justified as a sole source effort IAW the AFMC sole source criteria in SMC FFRDC Users Guide, Annex 1, Para. V.d (Annex 3, Attachment 4)?

(5) Can industry (e.g., a SETA company) perform the work and meet the criteria? If so, an FFRDC is precluded from doing the work.

e. **Process for small efforts.** For small efforts of \$25,000 or less some parts of the process are simplified. The criteria for performing the work remains the same and the material needed for the template must be generated. The following changes in process are acceptable:

(1) Aerospace must go through its normal internal review to determine if the work meets all criteria before initializing any Non-DoD efforts.

(2) No submittal is made by Aerospace to SMC for approval. Work may be initiated based on internal Aerospace Approval.

(3) On a quarterly basis Aerospace will submit to the SMC Chief Engineer (SMC/AX) a list of all small efforts initialized during the quarter. The list must include the task title, a very brief description of the effort, the funding and the customer.

(4) SMC may request the material used by Aerospace to decide if the task(s) are proper, if they have any questions of its appropriateness.

(5) If SMC/AX feels that the work does not meet the criteria, the problem will be resolved by the SMC Commander and the Aerospace CEO.

III. CONDITIONS FOR SELECTION OF NON-DOD WORK.

a. **Non-DoD, Direct Contract Space Work.** All non-DoD work must be supportive of national security and must fall within one of the following “Direct Space Support” or “Space Related Support” categories:

(1) **Direct Space Support.** Direct contribution to national security in the areas of space and space-related programs:

(a) **Other US National Security Agencies.** Work for other U.S. national security agencies; including but not limited to, the intelligence community, that portion of the DoE concerned with nuclear weapons development and production, allies under a mutual pact such as NATO.

(b) **National Space Efforts.** Support to the national space effort; including but not limited to, NASA programs, NOAA space programs, and other elements of the U.S. space program.

(c) **Other US Agencies.** Support to other U.S. agencies having joint efforts with the DoD; including but not limited to, ACDA, NOAA (DMSP) and civil space.

(2) **Space Related Support:**

(a) **Space Related efforts.** Work of direct interest to the DoD space and space-related effort but which is funded by other agencies having related interests requiring essentially the same work and results, including but not limited to, NSF work in materials, NOAA work in weather.

(b) **Long Term Interest.** Work of long-term interest to DoD but of more immediate interest to other agencies and consequently funded by them.

(c) **Augmented Capabilities.** Work that augments or helps to maintain capabilities, technologies, management methods and technical expertise of importance to Air Force space and space-related programs.

(d) **National Interest Contribution.** Work specifically justified by the U.S. Government as contributing to the National Interest of the United States, including but not limited to support of space programs of allies or international institutions.

(3) **Direct Space Support Work Has Priority Over Space Related Support If FFRDC Resources Are Limited**

b. **Sole Source Criteria.** The work must be justified as a sole source effort IAW the eleven AFMC sole source criteria in SMC FFRDC Users Guide, Annex 3, Attachment 4. and summarized below:

- (1) Freedom from bias due to predilection for design, hardware or approach.
- (2) Need for state-of-the-art information from Government Laboratories and universities.
- (3) Extent of access to Government Agencies planning information.
- (4) Extent of access to intelligence.
- (5) Need for industry proprietary information.
- (6) Access to industry proposals.
- (7) Need for extensive background information.
- (8) Need for diversified skills.
- (9) Need for outstanding specialists in specific fields.
- (10) Continuity of effort.

(11) Need for special facilities.

IV. INTENT.

It is the intent of the Air Force that the amount of non-DoD, Direct Contract Space work undertaken by the Aerospace FFRDC will not exceed limits set forth in Section 35.001 and other applicable sections of the FAR. The amount of commercial effort allowed will be determined by Annex 7 and Annex 11 ,Non-FFRDC Work..

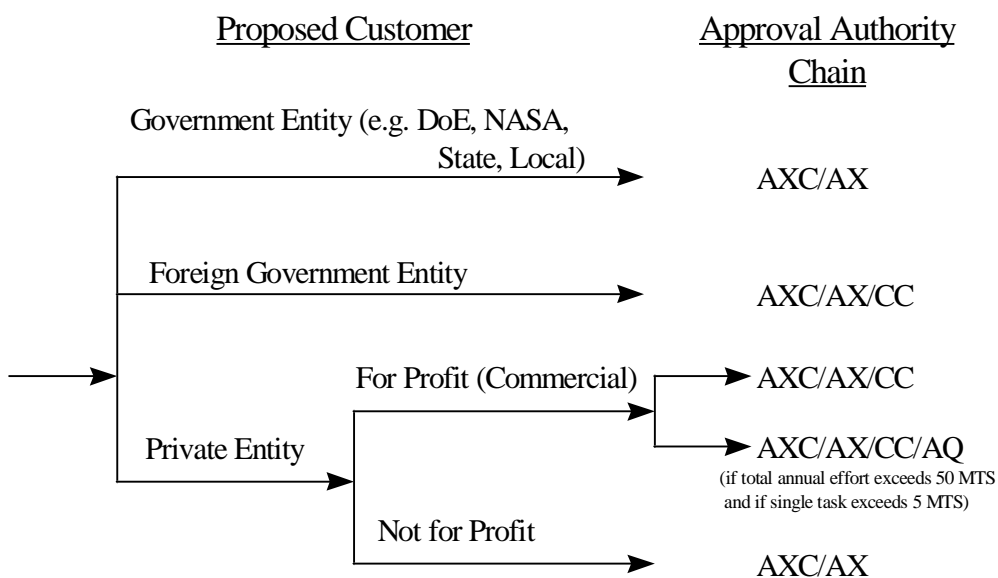
V. RESOLUTION OF WORK APPROVAL ISSUES.

In the event the SMC/AX determines that the selection of a given non-DoD project is not in keeping with this Annex, or that the selection sets a pattern for the future that in the Air Force's judgment is not in the spirit of this Annex, then the matter will be resolved by the SMC Commander and the President of The Aerospace Corporation. Air Force response, if any, which questions a given justification pursuant to this paragraph will be provided Aerospace within 30 days after receipt of the written justification.

ATTACHMENTS

1. Decision Flow for Aerospace Non-DoD Separate Contract Proposals [Also found in Annex 7, Atch 2]
2. Template Of Supporting Information Needed To Approve Requests For Non-DoD Work [Also found in Annex 7, Atch 3]
3. Example Transmittal Letter

Decision Flow for Aerospace Non-DoD Direct Contract Proposals


Notes:

- Private Entity is any entity that is not a Government entity
- A Commercial company is a for-profit company, per the 'Sponsoring Agreement for FFRDC' and FAR
- Ground rules:
 1. No competition (except as an FFRDC)
 2. No unauthorized release of Government data
 3. No manufacturing of operational systems

TEMPLATE
OF SUPPORTING INFORMATION NEEDED
TO APPROVE REQUESTS FOR NON-DOD, SEPARATE CONTRACT WORK

CUSTOMER:

- Describe the sponsor (government, non-profit) or commercial customer that has requested Aerospace support
 - Type of organization (corporation, consortium, subsidiary, small business, non-profit, agency)
 - General background, history and experience with the sponsor/customer
 - Describe the sponsor/customer's (and its parent company's) relationship to SMC, if any

OBJECTIVES & DESCRIPTION

- Describe the work, including level of effort (\$ and MTS) and period of performance
- Summarize work per SMC FFRDC Users Guide, Annex 2, FFRDC Tasks
- Discuss how effort augments existing Aerospace work for the Air Force
 - Enclose a copy of the Statement of Work or the Request for Proposal, if available

SUITABILITY OF AEROSPACE INVOLVEMENT

- Discuss how work is Mission Related (space or space-related)
- Discuss how effort is DDR&E core-competency work for the FFRDC
- Discuss why this work is not competitive with industry
 - Provide justification for Aerospace to perform the effort as a sole-source contractor
 - Provide statement or documentation that no other organization can perform the effort
- Discuss how Aerospace obtained the work

BENEFITS TO NATIONAL INTEREST (or DoD, AF, or SMC, if appropriate)

- Discuss how this work furthers the National interest (technical, economic, etc.)
- Discuss what National goals, if any, are addressed through this work
- Discuss how this work will affect Aerospace's ability to support SMC

RELATIONSHIP TO MOU

- Discuss how work contribution falls into categories defined in SMC FFRDC Users Guide, Annex 4, Para III.a, Non-DoD, Direct Contract Space Work
- Discuss how work contribution falls into eleven sole-source criteria defined in SMC FFRDC Users Guide, Annex 4, Para III.b. Criteria

OTHER

- Discuss whether the results the effort will releasable to the public.
- Proprietary data certification: Provide a statement as to how Aerospace will identify and protect any proprietary data for effort.
- Export Control: Indicate how Aerospace will comply with export control laws & regulations.
- Provide any other documents which support any of the above criteria.

EXAMPLE LETTER

DD MM YY

SUBJECT: Non-DoD Work: Proposal to XXX Entity, entitled "XXXXXX"

TO: Department of the Air Force
Space & Missile Systems Center/AXC
160 Skynet Street, Suite 2315
Los Angeles AFB, CA 90245-4683

ATTENTION: Mrs. Gloris J. Pickett, Contracting Officer

1. Pursuant to Annex 4, SMC FFRDC Users Guide, Paragraph II.b *[or c]*, regarding non-DoD work, the attached justification is provided. The proposal is to be submitted to XXX Entity, XXX [city, state, country].

2. The contemplated effort will be for XXX period commencing XXXX [date], for an estimated total cost of \$XXX and an expected level of XXX MTS.

Signed
Director, contract Management Department

Attachments:

Concur:

Concur:

Gloris J. Pickett
Contracting Officer

Paul Kocincki
Program Manager

|Date

Date

**PROCEDURES TO GOVERN THE MUTUAL USE OF OFFICE SPACE BETWEEN
THE AIR FORCE SPACE AND MISSILE SYSTEMS CENTER AND OTHER
AEROSPACE FFRDC USER PERSONNEL AND AEROSPACE FFRDC PERSONNEL**

I. PURPOSE: The purpose of this Annex is to outline policy and procedures on the mutual use of office space between the Air Force Space and Missile Systems Center (SMC) and other Aerospace FFRDC users and the Aerospace Corporation FFRDC.

II. GENERAL UNDERSTANDINGS

a. The mission of SMC and several other Air Force and Government organizations, PEO, Air Force Space Command and IMO in particular, is to plan and manage the acquisition of space systems, their ancillary equipments, launch sites, and facilities for on-orbit testing, command and control. This mission, learned from the experience of several decades, imposes special demands and constraints on prosecution of the effort and on the role and function of Aerospace, FFRDC.

b. Vital to the success of the mission is close daily rapport between the Air Force System Program Offices (SPO) and Aerospace Program Offices (APO). The Air Force and Aerospace have consequently formulated policies regarding the utilization of facilities to satisfy this need within the principle of sound facilities acquisition and management.

(1) Since the inception of the systems engineer/associate contractor method of systems acquisition, collocation (proximity) of SPOs and APOs has been a basic Air Force management principle of crucial importance to program success. The technical complexities and security classifications of these programs demand frequent, rapid, real-time, secure communications. Collocation improves the efficiency and effectiveness of the SPO and APO interface. Collocation expedites the technical interchange between the SPO and APO, it improves the accuracy of understandings on complex technical interface issues, it is cost effective on the efficient use of labor and equipment resources, and it avoids proliferation and circulation of highly classified documents outside the collocated area.

(2) Aerospace, in performing its FFRDC role, must support numerous customers who are involved in supporting the Nation's Space Mission. The majority of the FFRDC's support goes to SMC, NRO,

PEO, and AF Space Command. However, there are many other AF offices involved in the Space Mission including DUSD Space and the Space Architect as well as many DoD organizations such as NSA, BMDO, and the Army and Navy. Many civil organizations also play a vital role in space, primarily NASA and NOAA. This agreement includes the use of “office” space by Aerospace personnel located in any of the FFRDC users facilities in any location, and use of “office” space by the FFRDC users located in Aerospace facilities anywhere in the country.

(3) The principal objective of Aerospace facilities acquisition is to provide by purchase and/or lease, within the limits of corporate financial capability, office space and laboratories adequate to house Aerospace personnel, consistent with prudent business planning. Aerospace personnel thus should collocate in Government furnished facilities only to the extent necessary to fulfill corporate responsibilities in support of its customers. Similarly, all collocations in Aerospace facilities by SMC and other Aerospace FFRDC user personnel shall be limited to situations where such collocation is necessary for performance of the Aerospace FFRDC contract or in support of the Nation’s Space Mission.

(4) To achieve the advantages of collocation within appropriate facility management principles, a procedure for space exchange is necessary, i.e., the Air Force makes space available in its facilities for the collocation of Aerospace personnel, and Aerospace makes space available in its facilities for the collocation of Air Force personnel, to facilitate program support, enhance the maintenance of security and afford efficient utilization of the special facilities of each.

c. The needs of national security programs supported by Aerospace establish the priorities for determining which Aerospace elements are to be collocated in Government facilities, and which Government elements are to be collocated in Aerospace facilities.

d. In the interest of improving productivity, it is the common objective of SMC and other Aerospace FFRDC users and Aerospace to limit building occupancy to design capacity. It is the objective of SMC and other Aerospace FFRDC users and Aerospace to provide equivalent square feet per occupant for Aerospace and SMC and other Aerospace FFRDC user personnel at each site, recognizing that ratios may vary due to differing building designs.

e. In general, the total number of Government personnel collocated in Aerospace facilities shall not exceed the total number of Aerospace personnel collocated in Government facilities. However, short term (60 days) imbalances of Government personnel in Aerospace facilities are acceptable if such imbalances are necessary to meet Aerospace and Government contractual and mission objectives.

III. PROCEDURE. When a proposed relocation involving collocation appears to be in the mutual best interest of SMC and other Aerospace FFRDC users mission performance and Aerospace contractual performance the following will apply:

a. The 6592nd Air Base Group Commander (6592 ABG/CC), the Staff Office of Primary Responsibility for Space Allocation, and the Aerospace General Manager of Administrative Services will jointly:

- (1) describe the requirement for collocation.
- (2) Identify the number of affected Government space users and Aerospace space users.
- (3) Analyze the before and after effects of the proposed collocation on building utilization.
- (4) Evaluate any concomitant requirements of the proposed collocation for parking and/or support services.

b. The Office of Primary Responsibility for assuring proper coordination and obtaining approval by the Commander, SMC, is the Contracts Management Office, SMC/AXC. The corresponding Aerospace office is the Contracts Directorate. The SMC CC represents all government FFRDC users in this approval process.

c. The proposed collocations will be implemented upon the approval of the SMC Commander and The Aerospace Corporation President.

d. Personnel from any contractor supporting the Air Force (government) programs will be assigned office space in Aerospace facilities only with the prior written approval of the Two Letter organization or Government Program Office Director and the President of Aerospace (or designee). Such contractor employees will be counted as Air Force personnel for the purpose of maintaining the space allocation balance addressed in II.e above.

IV. MINOR CONSTRUCTION ON GOVERNMENT FACILITIES:

- a. All minor construction projects, i.e., renovations, alterations, upgrading, restoration of Government facilities to accommodate collocation of Aerospace personnel shall be subject to review and written approval by 6592 ABG/CC[current organization?] prior to being accomplished.
- b. All minor construction project approvals shall be based on mutually agreeable office standards applicable to both Government and Aerospace personnel located in Government facilities.
- c. The cost of minor construction to Government facilities by Aerospace as the result of Aerospace collocation in Government premises shall be borne by Aerospace and are subject to approval by the ACO as to allocability of costs for reimbursement under the contract.

V. AMENDMENT AND TERMINATION. This Annex may be amended or superseded by the Commander, SMC, and the President, Aerospace. This understanding may be terminated by either the Commander, SMC, or the President, Aerospace upon 30-day written notice to the other party.

DATE: 24 JANUARY 1997

ROGER G. DEKOK, Lt General, USAF
Commander, Space and Missile Systems Center

Enclosure 1 Atch

**PROCEDURES FOR ESTABLISHING COLLOCATION OF GOVERNMENT
AND THE AEROSPACE CORPORATION PERSONNEL**

I. Introduction. The Annex, 24 January 1997, provides for collocating Government personnel in The Aerospace Corporation facilities as well as collocating The Aerospace Corporation personnel in Government facilities. It also established procedures to be followed in effective and efficient performance of the Aerospace contract; however, each participant in this program must take constant precautions to prevent the use or practice of engaging in the use of personal or professional services as defined in FAR 37.101. Therefore, the physical location of The Aerospace Corporation personnel shall not make them subject to supervisory direction by Government personnel since such supervision constitutes personal services and must be avoided.

II. Procedures. The collocation of personnel encompasses two methods of locating personnel. First, the collocating of Government personnel in Aerospace facilities and second, the collocating of The Aerospace Corporation personnel in Government facilities. This procedure encompasses both methods.

- a. The SMC System Program Office (SPO) Director, or equivalent level from other Government organizations, is the office of primary responsibility for initiating all requests for collocation.
- b. The SPO Director's request shall include compliance with each of the steps described in the Annex, paragraph IIIa.
- c. The SPO Director's request will then be forwarded to SMC/AXC for staffing of the request as contemplated by the Annex, paragraph IIIb.
- d. Collocation can be effected after approval by notification from SMC/AXC that the SSD Commander and the President of The Aerospace Corporation have approved the collocation as contemplated by the Annex, paragraph IIIc.

III. Office Standards:**a. Standards for Government office space at The Aerospace Corporation:**

1. The work environment standard for office space allocation to Government personnel collocated at any Aerospace location will be based on generally accepted commercial practices (e.g., Aerospace's Standards) consistent with that which is required for the most cost efficient and professionally effective task accomplishment by management, scientific and engineering personnel.

2. The parties to the Annex recognize that within each organization, different levels of management and professional personnel exist based on assigned responsibilities, complexity of work and salaries. Therefore in all cases effort shall be made to provide physical office space and office standards based on these levels and in accordance with established organizational practices. Additionally, in all cases paramount consideration will be given to cost efficiency, professional effectiveness and the assignment of space which provides maximum use of the physical limitations of existing facilities and results in the minimum alteration/modification to existing facilities.

3. The office shall be sufficiently air conditioned and/or heated as necessary in accordance with Aerospace procedures and consistent with that service which is furnished to Aerospace personnel in the same or similar facilities. The quality and frequency of janitorial and maintenance service will be based on Aerospace standards conducive to an environment associated with the standard for management, scientific and engineering personnel.

4. The Aerospace Corporation shall provide office furniture and accouterments, i.e., drapes, pictures, desk sets, etc., that represent the most cost efficient furnishing of the office and which are in accordance with established standards for the comparable Aerospace levels of personnel based on the organizational level of the Government personnel and their assigned responsibilities, complexity of work or salary. Carpets are considered to be floor coverings only without regard to occupant and are not to be treated as furnishings.

b. Standards for the Aerospace Corporation in the Government Office Facilities:

1. The work environment standards for office space allocated to The Aerospace Corporation personnel collocated within any Government facilities shall be based on generally accepted local industry practices (e.g., 6592 ABG Standards) consistent with that which is required for the most cost efficient and professionally effective task accomplishment by management, scientific and engineering personnel.
2. The parties to the Annex recognize that within each organization different levels of management and professional personnel exist based on assigned responsibilities, complexity of work and salaries. Therefore in all cases effort will be made to provide physical office space and office standards based on these levels and in accordance with established organizational practices. Additionally in all cases paramount consideration will be given to cost efficiency, professional effectiveness and the assignment of space which provides maximum use of the physical limitations of existing facilities and results in the minimum alteration/modification to existing facilities.
3. The office shall be sufficiently air conditioned and/or heated as necessary in accordance with Government procedures and consistent with that service which is furnished to Government personnel in the same or similar facilities. The quality and frequency of janitorial and maintenance service will be based on standards conducive to an environment associated with the standard for management, scientific and engineering personnel.
4. The Aerospace Corporation shall provide their own office furniture and accouterments; i.e., drapes, pictures, desk sets, etc., when occupying Government facility space. The Aerospace Corporation shall employ the most cost efficient furnishing of the offices in accordance with established standards for The Aerospace Corporation levels of personnel. However, best efforts shall be made to establish close parity to Government personnel office standards for the specific purpose of avoiding the appearance or perception of significantly different levels of office standards. Carpets are considered to be floor coverings only without regard to occupant and are not to be treated as furnishings.

IV. Support Services to Collocated Personnel:

a. Parking:

1. The Government will provide adequate parking space to The Aerospace Corporation personnel collocated on Government facilities.
2. The Aerospace Corporation will provide parking spaces for all Government personnel collocated on Aerospace facilities.

b. Mail Delivery:

1. Mail delivery for Aerospace personnel collocated on Government facilities will be the responsibility of Aerospace.
2. Mail delivery for Government personnel collocated on Aerospace facilities will be delivered by the appropriate government organizations to stations at Aerospace as provided by the SPO Director.

c. Safety. All collocated personnel both Air Force and Aerospace will adhere to the existing safety regulations applicable to their location.

d. Security. All collocated personnel will adhere to the existing security regulations applicable to their location.

e. Office Supplies. Each organization is responsible for providing office supplies to their own personnel.

f. Telephone Service. Telephone service for collocated personnel will, as a general rule, be provided by the respective communication center. The reason for this arrangement is because both The Aerospace Corporation and the Government have separate telephone systems. Should either of the organizations collocated on the other's premises elect to be serviced by the

telephone system of the site organization, such arrangements can be made on a case by case basis. Whenever a collocated organization requests to be serviced by the site organization, the installation of the telephones will be accomplished and paid for by the site organization. In the case of The Aerospace Corporation, installation costs will be an allowable cost because of the need for operational interface of personnel collocated to perform program functions.

Whenever the collocated guest vacates the site organization's premises, the installed telephone lines will be the responsibility of the site organization to either retain or terminate. The charges for use of the telephone system will be paid by the user from appropriate funds.

g. Reporting of Collocation Space. SMC/AXC will be the Government office responsible for maintaining records of all collocated space. The Aerospace Corporation focal point for maintaining records of all collocated space is The Aerospace Corporation Contracts Directorate. These two offices will jointly prepare quarterly reports indicating collocated space occupied by the Government and Aerospace by building number, square feet occupied, number of occupants, and applicable Government Office symbol. SMC/AXC and The Aerospace Corporation Contracts Directorate will assure that there is not an imbalance of collocated spaces at either Government or Aerospace locations. Any imbalance will be referred to the SMC Commander and The Aerospace Corporation President for resolution since they are the principals of the Annex. A copy of the quarterly report shall be sent to both SMC/AXC and Aerospace contracts office to allow update of their Office Space Management System data base.

**ENABLING CLAUSE FOR GENERAL SYSTEMS ENGINEERING AND
INTEGRATION**

Purpose: The purpose of this Annex is to present the accepted wording for the Enabling Clause for General Systems Engineering and Integration (GSE&I).

(Beginning of Clause)

a. This contract covers part of the * program which is under the general program management of the **. The Air Force has entered into a contract with The Aerospace Corporation for the services of a technical group which will support the DoD program office by performing General Systems Engineering and Integration.

b. General Systems Engineering and Integration (GSE&I) deals with overall system definition; integration both within the system and with associated systems; analysis of system segment and subsystem design; design compromises and tradeoffs; definition of interfaces; review of hardware and software, including manufacturing and quality control; observation, review and evaluation of tests and test data; support of launch, flight test, and orbital operations; appraisal of the contractors' technical performance, through meeting with contractors and subcontractors, exchange and analysis of information on progress and problems; review of plans for future work; developing solutions to problems; technical alternatives for reduced program risk; providing comments and recommendations in writing to the DoD System Program Manager and/or Project Officer as an independent technical assessment for consideration for modifying the program or redirecting the contractor's efforts; all to the extent necessary to assure timely and economical accomplishment of program objectives consistent with mission requirements.

c. In the performance of this contract, the contractor agrees to cooperate with The Aerospace Corporation by responding to invitations from authorized personnel to attend meetings; by providing access to technical information and research, development planning data such as, but not limited to, design and development analyses; test data and results; equipment and process specifications; test and test equipment specifications and procedures, parts and quality control procedures, records and data; manufacturing and assembly procedures; and schedule and milestone data; all in their original form or reproduced form and excluding financial data; by delivering data as specified in the Contract Data Requirements List; by discussing technical matters relating to this program; by providing access to

contractor facilities utilized in the performance of this contract; and by allowing observation of technical activities by appropriate Aerospace technical personnel. The Aerospace personnel engaged in general systems engineering and integration effort are authorized access to any technical information pertaining to this contract.

d. The contractor further agrees to include in each subcontract a clause requiring compliance by subcontractor and succeeding levels of subcontractors with the response and access provisions of paragraph (c) above, subject to coordination with the contractor. This agreement does not relieve the contractor of his/her responsibility to manage the subcontracts effectively and efficiently nor is it intended to establish privity of contract between the Government or The Aerospace Corporation and such subcontractors.

e. The Aerospace Corporation personnel are not authorized to direct the contractor in any manner. The contractor agrees to accept technical direction as follows:

1. Technical direction under this contract will be given to the contractor solely by***.
2. Whenever it becomes necessary to modify the contract and redirect the effort, a Change Order signed by the Contracting Officer, or Supplemental Agreement signed by both the Contracting Officer and the Contractor will be issued.

(End of Clause)

*Insert name of program.

** In all contracts except those for SAFSP insert "Air Force Space and Missile Systems Center (SMC)." In SAFSP contracts insert "Secretary of the Air Force, Special Projects (SAFSP)."

***Insert "SMC" or "SAFSP" as appropriate.

**PROCESS INSTRUCTION TO OBTAIN APPROVAL
OF
COMMERCIAL WORK BY THE AEROSPACE CORPORATION**

1. The purpose of this Annex is to outline the procedures for Aerospace Corporation to request approval to contract for work directly with for-profit, “commercial entities,” under special circumstances.
2. Approval of such “commercial work” is a work performance exception to the DoD Federally Funded Research And Development Centers (FFRDC) Management Plan, 1 May 1996, Section D, Paragraph b, “Non-DoD work. The ultimate approval authority for Aerospace Corporation work performance exceptions is the primary sponsor, SAF/AQ.
3. Effective 7 Mar 96, SAF/AQ, through agreement with SMC/CC, delegated limited authority for SMC/CC to approve commercial work requests. This delegation authority is limited to a total of 50 MTS years per year. This delegation authority of 50 MTS years per year is not cumulative. The delegation specifically limits the maximum amount of effort that Aerospace Corporation can perform in any given year to 50 MTS years. Attachment 1 dated 13 Jan 1997 provides more details on the SAF/AQ agreement.
4. Commercial work is considered Non-DoD and Non-FFRDC work. The Decision Flow for Aerospace Non-DoD Direct Contract Proposals (Attachment 2), is a flow chart of the approval process for non-DoD, Direct Contract efforts. This chart includes the approval process for Private Entity, For Profit (Commercial) efforts. The process for evaluating “commercial work requests” and the associated criteria for evaluating commercial requests in an effective and timely manner are described in more detail in Attachment 3, Criteria For Approval Of Commercial Work Requests From The Aerospace Corporation. All requests for commercial work will be presented in accordance with the Template Of Supporting Information Needed To Approve Requests For Non-DoD Direct Contract Work (Attachment 4).
5. A brief summary of the approval process and criteria for commercial work follows:
 - a. Because most “commercial” requests for Aerospace to assist commercial firms are expected to be short suspenses in order to react to exceptional situations, this approval process is a comparatively informal, but is nonetheless a carefully documented process. In brief, the Aerospace Corporation President will request approval via a letter with supporting documentation provided according to the Template (Attachment 4) to the SMC/CC. SMC Chief Engineer (SMC/AX) or his designee will evaluate the request based on three principal criteria (5c below) and will forward a recommendation to the SMC Commander. If the effort is within the 50 MTS as well as under the 5 MTS-years (Attachment 1) limits of his delegation authority, the SMC Commander or his designee will review the recommendation and make a determination. The SMC Commander or his designee will forward the decision to the Aerospace Corporation President.
 - b. If the effort is not within the 50 MTS and 5 MTS-years delegation authority, or if there are unusual issues which are not within the approval criteria, the SMC Commander will forward the

request to SAF/AQ for determination. Ultimate responsibility for approval (or disapproval) will rest with SAF/AQ.

c. Each request would be evaluated on its own merits but must satisfy three principal criteria:

(1) The work must satisfy at least two of the essential elements of DDR&E core work (SMC Process Guide, Annex 3, Attachment 2); specifically, the work must fit within the FFRDC's mission and use only core competencies of the FFRDC.

(2) The work must be non-competitive with Industry capabilities and must not create any reasonable perception of potential conflict-of-interest. There must be no public perception that the FFRDC is being allowed to expand inappropriately.

(3) The work must be in the "national interest;" that is, the work must serve some perceived National goal (not necessarily a DoD goal) and not be perceived as routine business.

d. Each request will prepared in accordance with the Template Of Supporting Information Needed To Approve Requests For Non-DoD Direct Contract Work (Attachment 4).

6. The decision to approve or disapprove any commercial work will be based on the criteria described in this Annex. No single criterion shall be considered to be sufficient for recommending approval of a given request. All agents involved in this process must always remain cognizant that commercial work requests will be approved only for exceptional cases.

7. For the approval and execution of all commercial work efforts, Aerospace Corporation and SMC will comply with DoD Federally Funded Research And Development Centers (FFRDC) Management Plan, the Sponsoring Agreement Between The United States Air Force And The Aerospace Corporation For The Operation Of The Aerospace FFRDC, the SMC FFRDC Users Guide, and any additional direction from the primary sponsor, SAF/AQ (Attachment 1).

e. Simplified process for small efforts. Process for small efforts. For small efforts of \$25,000 or less some parts of the process are simplified. The criteria for performing the work remains the same and the material needed for the template must be generated. The following changes in process are acceptable.

(1) Aerospace must go through its normal internal review to determine if the work meets all criteria before initializing any Non-DoD efforts.

(2) No submittal is made by Aerospace to SMC for approval. Work may be initialized based on internal Aerospace Approval.

(3) On a quarterly basis Aerospace will submit to the SMC Chief Engineer (SMC/AX) a list of all small efforts initialized during the quarter. The list must include the task title a very brief description of the effort, the funding and the customer.

(4) SMC may request the material used by Aerospace to decide if the task(s) are proper , if they have any questions of its appropriateness.

(5) If SMC/AX feels that the work does not meet the criteria, the problem will be resolved by the SMC Commander and the Aerospace CEO.

Attachments:

1. SAF/AQ Memoranda
2. Decision Flow for Aerospace Non-DoD, Direct Contract Proposals
3. Criteria for Approval of Commercial Work Requests from The Aerospace Corporation
4. Template of Supporting Information Needed to Approve Requests for Non-DoD, Direct Contract Work

13 January 1997

MEMORANDUM FOR SMC/CC

FROM: SAF/AQX

SUBJECT: Federally Funded Research and Development Center (FFRDC) and Non-FFRDC Work at the Aerospace Corporation

The purpose of this memorandum is to establish policy for non-FFRDC (including commercial) efforts by the Aerospace Corporation in accordance with section D.1.b., of the DoD FFRDC Management Plan.

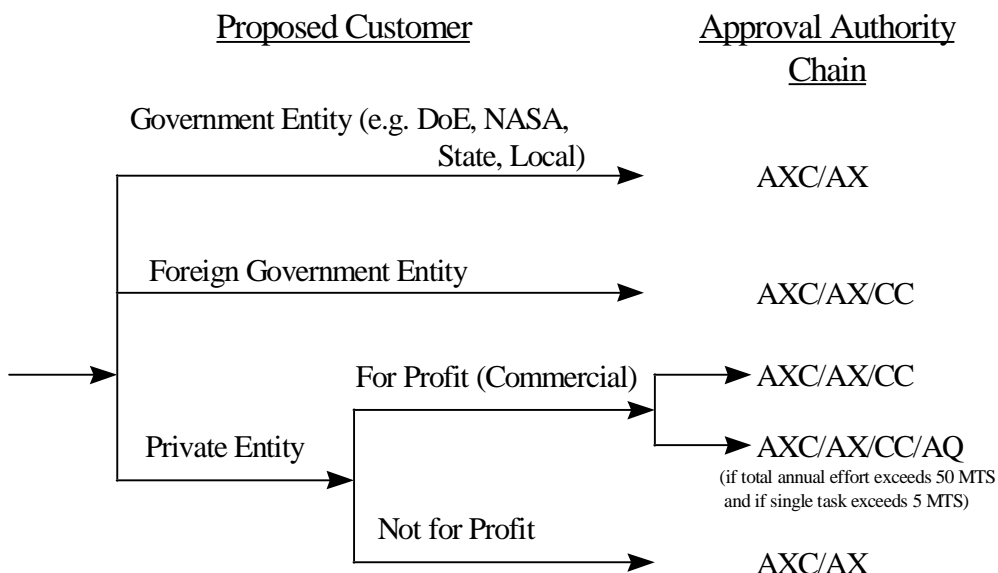
The Aerospace Corporation may perform non-FFRDC work subject to your written review and approval establishing that the work: (1) is in the national interest; (2) does not undermine the independence, objectivity, or credibility of the FFRDC by posing an actual or perceived conflict of interest, or detract from the performance of FFRDC work; and (3) is not acquired by taking unfair advantage of the Aerospace Corporation's operation of the FFRDC or of information that is available to the Aerospace Corporation only through the FFRDC.

You should insure that all non-FFRDC efforts that you approve are received by the Aerospace Corporation on a non-competitive basis and in the case of Federal Government work, are accompanied by a sole source justification using any other exception to CICA than the FFRDC exemption.

With specific regard to the commercial work, SAF/AQ has delegated to you the authority to approve up to 50 staff years of technical effort (STE) of commercial projects per year. Please remember that any individual project or effort for more than 5 STE must be forwarded to SAF/AQ for approval.

BLAISE J. DURANTE
Deputy Assistant Secretary
(Management Policy & Program Integration
Assistant Secretary (Acquisition))

Decision Flow for Aerospace Non-DoD Direct Contract Proposals


Notes:

- Private Entity is any entity that is not a Government entity
- A Commercial company is a for-profit company, per the 'Sponsoring Agreement for FFRDC' and FAR
- Ground rules:
 1. No competition (except as an FFRDC)
 2. No unauthorized release of Government data
 3. No manufacturing of operational systems

**CRITERIA FOR APPROVAL
OF COMMERCIAL WORK REQUESTS
FROM THE AEROSPACE CORPORATION**

I. DEFINITION OF “COMMERCIAL WORK”

1. For the purpose of this process, the phrase “commercial work requests” should be regarded as shorthand for “requests by the Aerospace Corporation to accept work from commercial entities.”

That is, the “commercial” aspect of these requests lies in the nature of the customer that has requested assistance from the Aerospace Corporation, not in the nature of the work itself.

2. The Government has no intent to allow the FFRDC to participate in any activity that would normally be regarded by Industry as “commercial” -- that is, the active marketing or selling of products (whether hardware, software, knowledge or “expertise”) that would commercialize, or take unfair advantage of, the Aerospace Corporation’s status as an FFRDC.

II. DESCRIPTION OF THE APPROVAL PROCESS

1. Although the Aerospace Corporation may provide SMC with advance notice of an impending commercial work request either orally or via a brief electronic or written communication from the President of Aerospace to SMC/CC, Aerospace must provide at least two key documents to SMC before SMC will formally evaluate the work request.

a. First, Aerospace will provide a letter of request that generally describes (1) the work that is being requested, (2) who has requested the work, (3) the expected period of performance, (4) the expected level of effort and value of the work, and (5) why this work is in the National interest.

b. Second, Aerospace will provide SMC with a more detailed package, prepared in accordance with the Template Of Supporting Information Needed To Approve Requests For Non-DoD Direct Contract Work (Attachment 4), that explicitly addresses at least the following questions: (1) How this work meets the “mission” and “core competency” elements of the DDR&E definition of “core work”; (2) Why this work should be classed as “non-competitive”; (3) Why this work is in the National interest; (4) Sufficient description of the “customer” to enable SMC to ascertain the customer’s commercial nature and its probable role and relationship in Industry; (5) A description of the requested work in sufficient detail to assure SMC that the work is well-defined.

2. When the SMC Chief Engineer has received sufficient information to complete a rational assessment of the request, the SMC Chief Engineer will advise SMC/CC concerning his findings. If the effort is within the 50 MTS delegation authority, the SMC Commander or his designee will review the recommendation and determine the approval. The SMC Commander or his designee will forward the approval decision to the Aerospace Corporation President.

3. If the effort is not within the 50 MTS-year and 5 MTS single effort delegation authority, or if there are unusual issues which are not within the approval criteria, SMC/CC will offer a formal recommendation directly to SAF/AQ. However, no formal recommendation for

approval/disapproval will be forwarded to SAF/AQ until Aerospace has supplied sufficient written documentation to support the request. Ultimate responsibility for final approval/disapproval of each request for commercial work rests with SAF/AQ.

III. CRITERIA FOR APPROVAL

1. After Aerospace has provided sufficient information to assure an adequate evaluation of the requested commercial work, the SMC Chief Engineer or his designee will apply the following four criteria:

a. Core Work:

(1) The proposed commercial activity must meet at least two of the three essential elements of core work as defined by DDR&E (SMC Process Guide, Annex 3, Attachment 2). Specifically, the activity must fit within the mission of the FFRDC and must use the FFRDC's core competencies.

(2) For the Aerospace Corporation, the "mission" test essentially examines whether the work is related to "space systems;" similarly, the "core competency" test essentially examines whether the proposed activity uses expertise derived from the FFRDC's normal space systems work.

b. Non-Competitive:

(1) The proposed commercial activity must not place the Aerospace Corporation in direct or indirect competition with any U.S. commercial entity. Specifically, the activity must meet two "non-competitive" tests:

(i) First, it must not create any reasonable perception that the FFRDC's "freedom from conflict of interest" might be compromised if the Aerospace Corporation were to perform the proposed work;

(ii) Second, it must not be a routine activity for which the commercial customer could reasonably be expected to solicit (and find) sources from within U.S. Industry.

(2) Remembering that "conflict of interest" is often based as much on perception as on fact, the SMC Chief Engineer must guard against allowing the Aerospace Corporation to participate in any activity that might reasonably be expected to limit the FFRDC's ability to participate (in its usual advisory capacity) in any future source selection. Also, whereas an actual "sole source" determination is not required to meet these tests, the SMC Chief Engineer must guard against allowing any activity that reasonably and normally would be performed by Industry.

c. National Interest:

(1) The proposed commercial activity must comprise work that supports a National goal or clearly serves the public interest. In particular, the activity should not engender any perception that it is primarily for the purpose of "fully employing" Aerospace Corporation personnel.

(2) Graybeard panels, participation in accident investigations and reviews, support of multi-national space programs, and activities in association with the National Institute for Justice(NIJ) Western Region Law Enforcement Center clearly fall within the bounds of this test.

However, other activities that can not be otherwise supported by Government or Industry might also meet this test.

(3) The SMC Chief Engineer must be especially wary of allowing any activity, however “noble,” that might be perceived as an inroad toward the “commercialization” of the FFRDC’s capabilities, knowledge, and expertise.

IV. FINAL CAUTION

The SMC Chief Engineer’s recommendation to the SMC Commander must be based on the criteria described above. No single criterion should be considered to be sufficient for recommending approval of a given request. In particular, all agents in this process must always remain cognizant that commercial work requests will be approved only for exceptional cases.

**TEMPLATE (DEVELOPED BY SMC/AEROSPACE IPT IN 1995)
OF SUPPORTING INFORMATION NEEDED
TO APPROVE REQUESTS FOR NON-DOD DIRECT CONTRACT WORK**

- Describe the sponsor (government, non-profit) or commercial customer that has requested Aerospace support
 - Type of organization (corporation, consortium, subsidiary, small business, non-profit, agency)
 - General background, history and experience with the sponsor/customer
 - Describe the sponsor/customer's (and its parent company's) relationship to SMC, if any

OBJECTIVES & DESCRIPTION

- Describe the work, including level of effort (\$ and MTS) and period of performance
- Summarize work per SMC FFRDC Users Guide, Annex 2, FFRDC Roles/Tasks
- Discuss how effort augments existing Aerospace work for the Air Force
 - Enclose a copy of the Statement of Work or the Request for Proposal, if available

SUITABILITY OF AEROSPACE INVOLVEMENT

- Discuss how work is Mission Related (space or space-related)
- Discuss how effort is DDR&E core-competency work for the FFRDC
- Discuss why this work is not competitive with industry
 - Provide justification for Aerospace to perform the effort as a sole-source contractor
 - Provide statement or documentation that no other organization can perform the effort
- Discuss how Aerospace obtained the work

BENEFITS TO NATIONAL INTEREST (or DoD, AF, or SMC, if appropriate)

- Discuss how this work furthers the National interest (technical, economic, etc.)
- Discuss what National goals, if any, are addressed through this work
- Discuss how this work will affect Aerospace's ability to support SMC

RELATIONSHIP TO OTHER NON-DOD CRITERIA

- Discuss how work contribution falls into categories defined in SMC FFRDC Users Guide, Annex 4, Para III.a, Non-DoD Direct Contract Space Work
- Discuss how work contribution falls into eleven sole-source criteria defined in SMC FFRDC Users Guide, Annex 4, Para III.b. Criteria

OTHER

- Discuss whether the results of the effort will be releasable to the public.
- Proprietary data certification: Provide a statement as to how Aerospace will identify and protect any proprietary data for the effort.
- Export Control: Indicate how Aerospace will comply with export control laws & regulations.
- Provide any other documents which support any of the above criteria.

PROCESS INSTRUCTION FOR PERFORMANCE EVALUATION**I. PURPOSE.**

The purpose of this Annex is to outline the procedures for the performance evaluation of the Aerospace Corporation FFRDC. This Annex replaces the former SMCR 800-7.

II. SEMI-ANNUAL, CONTRACT PERFORMANCE EVALUATION.

a. **Award Fee Plan.** The Award Fee Plan to the Aerospace Corporation FFRDC contract (Atch 1) is the basis for performance evaluation and for determination of the Award Fee. The Award Fee Plan, or its replacement, is the ultimate authority regarding the performance evaluation process. All FFRDC contract users will comply with the Award Fee Plan. Since the Award Fee Plan is an attachment to the Aerospace Corporation FFRDC contract, it is subject to annual revision.

b. **Fee Determination Process.** The Award Fee Plan will determine the Award Fee Review Board membership, procedures and responsibilities. Until modified by a future Award Fee Plan or its replacement, the Award Fee Review Board (ARB) briefing and the Fee Determining Official (FDO) briefing will be combined into one briefing. At the combined ARB/FDO briefing, the following procedures will apply. Aerospace will be invited to address the ARB members and the FDO. After Aerospace executives leave the room, each major user (SMC two-letter program directors or Non-SMC equipment) will brief the FDO on performance and customer satisfaction. Each major user can anticipate a scheduled, ARB/FDO briefing time of ten minutes. The SMC/AXC Program Manager then will brief Corporate Management and the PCO will brief Corporate Cost. The FDO will temporarily leave the briefing while the ARB members vote on an award fee recommendation. The FDO will then return to receive the ARB members' recommendation on the award fee. The FDO will make the final award fee decision. Other major Non-SMC customers utilizing other FFRDC contracts may also be requested to participate in this process.

c. **Procedures.** The Award Fee Plan will determine annual evaluation and semi-annual interim evaluation periods. Performance will be evaluated as follows:

(1) **Customer Satisfaction.** At the discretion of each major user (SMC two letter program director or agency equivalent), each director will assess the performance of the FFRDC at the major user OR at the major program level. The minimum requirement is a single, summary evaluation at the major user (two letter or agency) level. For example, SMC/CL, Launch Vehicles, may submit a single, summary evaluation at the SMC/CL level or several summary evaluations at the major program (Atlas, Titan, Delta) level. This major user evaluation will reflect the results of individual evaluations given by each Functional Area Evaluator (FAE) through each Functional Area Chief (FAC) for each Technical Objective and Plan (TO&P). Each major user will retain documentation of the FAE and FAC evaluations at the TO&P level for surveillance purposes. Each major user should have the ability to brief Aerospace personnel on their performance at the TO&P level. Any weaknesses identified will be discussed with the appropriate Aerospace personnel in an effort to expeditiously resolve the problem. Each major user will be able to field ARB/FDO questions at the TO&P level during the ARB/FDO briefing.

(a) Each major user will assess Customer Satisfaction and submit the following documents to SMC Chief Engineer (SMC/AX):

1. A completed AFMC Form 1641 (Atch 2). This form has been modified from the “below standard, meets standard, above standard” ratings to the Award Fee Standards ratings ranging from “unsatisfactory” to “excellent.” The correlation between the old AFMC Form 1641 Performance Rating, the Award Fee Standards Rating and the Numerical Rating to be placed on the form by the major user is as follows:

Old Performance Rating	Award Fee Standards Rating	Numerical Rating
Above Standard (76%-100%)	Excellent	91-100%
	Very Good	76-90%
Meets Standard (26-75%)	Good	51-75%
	Satisfactory	26-50%
Below Standard (0-25%)	Unsatisfactory	0-25%

Complete the form by rating each of the eleven Customer Satisfaction Criteria (Atch 3) using the above Numerical Ratings (0-100%) according to the Award Fee Standards Definitions (Atch 4).

2. A completed Customer Satisfaction Sheet (Atch 5). Complete a Customer Satisfaction Sheet, summarized at the major user (or major program) level, with examples for each of the eleven Customer Satisfaction Criteria. This Customer Satisfaction Sheet should support the Numerical Ratings in the AFMC Form 1641 above. Use one or two clear bullet statements to indicate major strengths and weaknesses for each criteria. Use bullets only; do not use sentences. Use asterisks to show the level of importance of the strengths and weaknesses as follows:

*Minor

** Moderate

***Major

3. A completed set of Customer Satisfaction Briefing Slides (Atch 6). Summarize the data on the Customer Satisfaction Sheet, above, on the briefing slides at the major user (or major program level). The two letter program director, agency equivalent, or designee will brief these slides to the ARB/FDO.

(b) An example of a Customer Satisfaction Tasking Letter is at Attachment 7. An example of a completed, major user package is at Attachment 8.

(2) **Corporate Management.** The SMC/AXC Program Manager will submit an evaluation of Corporate Management and will brief the ARB/FDO in accordance with the Award Fee Plan.

(3) **Corporate Cost.** The SMC/AXC PCO will submit an evaluation of Corporate Cost and will brief the ARB/FDO in accordance with the Award Fee Plan.

ATTACHMENTS

1. Award Fee Plan

- 2. AFMC Form 1641**
- 3. Customer Satisfaction Criteria**
- 4. Award Fee Standards Definitions**
- 5. Customer Satisfaction Sheet**
- 6. Customer Satisfaction Briefing Slides**
- 7. Example of a Customer Satisfaction Tasking Letter (Request for FY 97 Aerospace Award Fee Performance Evaluation)**
- 8. Example of a Completed, Major User Package**

DRAFT

ANNEX 8
Attachment 1

AWARD FEE PLAN
FOR
F04701-93-C-0094 (Aerospace)
June 1994

APPROVED:

Award Review Board Chairperson

Director of Contracting:

Fee Determining Official:

1. Introduction:

The Award Fee Plan is the basis of the Award Fee for the Aerospace Corporation FFRDC Contract F04701-93-C-0094. The Fee Determining Official (FDO) will determine the Award Fee earned and payable in accordance with (IAW) this plan. The FDO, prior to the start of an evaluation period, may unilaterally modify the Award Fee performance criteria and areas applicable to the next evaluation period. The contracting officer will notify Aerospace, in writing, of the changes and modify the Award Fee Plan accordingly. Changes to this plan that are applicable to the current evaluation period, will be incorporated by mutual consent. The specific criteria and procedures used to assess Aerospace performance and to determine the amount of Award Fee earned are described herein. The award fee criteria contained within this plan identify those items of importance, under control of Aerospace, which are susceptible to qualitative and subjective evaluation. Award fee determinations, made by the FDO, are not subject to the "Disputes Clause" of this contract.

For the initial year of the contract, Aerospace will be allowed a fixed fee based on a "Fee for Need" evaluation pursuant to DFARS 215.972. For subsequent years, this contract will consist of an award fee for Aerospace Sponsored Research (ASR) based on prior years performance. This approach allows for planning and an orderly adjustment to the ASR Program prior to the start of the fiscal year.

The base fee amount will be negotiated annually for subsequent years pursuant to a Fee for Need analysis IAW DFARS 215.972. The award fee pool will include the total amount of the Aerospace Sponsored Research (ASR) program relevant to SMC program for the following fiscal year. There will be no "rollover" of unearned award fee from one award fee period to another.

Award fee will be determined annually and is comprised of three areas. The first area is "Customer Satisfaction" (using SSDR 800-7) which shall be completed by all Aerospace customers (DOD) at the end of each award fee period and will reflect results of individual evaluations given by their Functional Area Evaluators (FAEs) for each Technical Objective and Plan (TO&P) project. The second and third areas evaluates corporate management and cost respectively with SMC/PKR and SMC/SDC as the performance monitors. The Functional Area Evaluators (FAEs), through their Functional Area Chiefs (FACs) and program directors, will be performance monitors responsible for "Customer Satisfaction" .

Interim evaluations will be provided every six months (at the midpoint of the award fee period). After this evaluation, the Award Fee Review Board (AFRB) chairperson will send an interim letter to Aerospace which addresses its performance. The chairperson of the AFRB may also issue letters at any other time deemed necessary to highlight areas of government concern. For each letter issued, Aerospace is to provide a written response within 30 days that addresses plans for improvement in the areas addressed or explain why it is not feasible to do so.

2. Organization and Responsibilities**a. The Award Fee Organization consists of:**

- (1) Fee Determining Official (FDO), SMC/CC/CV

(2) Award Fee Review Board (AFRB) which consists of a chairperson, board members and a secretary/recorder. The members of the AFRB are listed in attachment 1.

b. The FDO's Responsibilities are to:

- (1) Approve the award fee plan and any significant changes to the plan
- (2) Approve the members of the AFRB and appoint an AFRB chairperson
- (3) Determine the amount of award fee earned and payable to Aerospace
- (4) Provide Aerospace with a written decision concerning the amount of award fee earned for each evaluation period together with an evaluation of Aerospace's performance as measured IAW the award fee evaluation criteria.

c. The AFRB's responsibilities are to:

(1) Convene at the time, date and place established by the chairperson, and will consider information submitted by the following sources to make an award fee recommendation to the FDO.

a. Evaluations submitted by designated performance monitors

b. Assessments or inputs from other sources (i.e., DCMDW, DCAA, etc)

c. The AFRB members, after receiving the presentations of the monitor's evaluations and point score recommendations and reviewing all available information as appropriate, shall individually vote on each criteria area by signed ballot.

(2) Recommend changes to the award fee plan as needed.

The chairperson of the AFRB will select a secretary/recorder who will notify board members and performance monitors of meetings, when evaluations are due, and consolidate those evaluations into a draft performance evaluation report.

(3) Provide Aerospace with interim performance evaluation reports

d. The performance monitors responsibilities are to:

- (1) Monitor and oversee Aerospace performance in their assigned areas.
- (2) Prepare an Aerospace performance evaluation report/briefing IAW SDDR 800-7 and the award fee plan

3. Evaluation Periods/Criteria and Amounts

Attachment 1

a. The award fee percentage will be determined at the completion of the evaluation periods shown below:

No.	Award Evaluation Period	
1	1 Oct 93 - 30 Jun 94	(for FY95 use)
2	1 Jul 94 - 30 Jun 95	(for FY96 use)
3	1 Jul 95 - 30 Jun 96	(for FY97 use)
4	1 Jul 96 - 30 Jun 97	(for FY98 use)

b. The performance evaluation areas will be evaluated using the performance criteria contained in SSDR 800-7 (for Customer Satisfaction) and attachment 2 for (Corporate Management and Cost). For the initial evaluation period, the performance evaluation areas with their corresponding percentage are set forth below:

Area A:	Customer Satisfaction	70%
Area B:	Corporate Management	15%
Area C:	Corporate Cost	15%

Aerospace will earn award fee by achieving a level of effectiveness IAW the award fee standards set forth below. Aerospace's overall effort in a particular area (i.e., customer satisfaction, corporate management or corporate cost) rated below the award fee standard of "satisfactory" will render the contractor ineligible to receive an award fee for that performance evaluation area.

Grade	Point Score	Percentage of Award Fee Earned
Above Standard		
Excellent	91 - 100	91 - 100
Very Good	76 - 90	76 - 90
Meets Standard		
Good	51 - 75	51 - 75
Satisfactory	26 - 50	2 - 50*
Below Standard		
Unsatisfactory	0 - 25	0

*Percent earned equals point score minus 25 times 2: (PS-25)*2

4. Interim Evaluations:

Interim Aerospace performance evaluations will be prepared by the performance monitors and provided to the recorder at the mid-point of the award fee period IAW SSDR 800-7, and this award fee plan. The results of the interim evaluation will be provided to Aerospace by the AFRB chairperson, citing major items that could affect the final performance evaluation ratings. This interim evaluation will not result in a determination of award fee, but will be an input for the final determination for the evaluation period.

5. Process for Determining Award Fee

- a. Members of the AFRB shall, on an annual basis, evaluate Aerospace's performance using evaluations submitted by the performance monitors.
- b. The AFRB secretary/recorder shall notify each performance monitor (FAC/FAE) 60 days prior to the end of the evaluation period. The evaluation forms (AFSC Form 1641) shall be completed and returned to the secretary/recorder no later than the completion of the period (30 Jun each year).
- c. Performance monitors (FAC/FAE) shall be available to brief the AFRB.
- d. The board will evaluate the performance monitors reports/briefings.
- e. The AFRB chairperson shall prepare an Aerospace performance evaluation report for the FDO within 30 days after the close of the evaluation period.
- f. The AFRB chairperson shall present the AFRB's recommendation of award fee and any changes to the award fee plan to the FDO.
- g. The AFRB chairperson shall prepare the FDO's letter that informs Aerospace of the award fee established for the subsequent option and Aerospace' performance evaluations.
- h. The FDO shall unilaterally determine the award fee earned by Aerospace and shall provide a written decision to Aerospace and the contracting officer within forty five days after the close of the evaluation period.
- i. An Aerospace debrief shall be given.

6. Award Fee Integrity

The award fee process is recognized to be subjective in nature. Every effort shall be made to assure fairness. The written records of the performance monitors, the inputs from other pertinent sources (i.e., DCMDW, DCAA, etc.) and the Aerospace self-assessment assist in providing the checks and balances necessary to assure award fee integrity.

7. Payment of Award Fee

The award fee for each year of the contract shall be determined by performance in the prior year as indicated in paragraph 1, above. Award fee is to be billed and paid to Aerospace in the same manner as fixed fee in the following fiscal year.

8. Aerospace Self Assessment

Optional written Aerospace self-assessment of performance may be submitted to the chairperson of the AFRB through the PCO for each evaluation period under consideration. Self-assessments

Attachment 1

shall be no more than 10 pages in length and shall be submitted no later than five working days following the close of evaluation period.

Attachment

1. AFRB Membership
2. Area Evaluation Criteria
3. Sample Award Fee Calculation

AFRB MEMBERSHIP

1. Director of Program Management	SMC/SD*
2. Air Force Program Executive Officer for Space (or designee)	AFPEO/SP
3. Chief Engineer	SMC/EN
4. Director of Contracting (or designee)	SMC/PK
5. Engineering Contracts Division Chief	SMC/SDC
6. Contracting Officer	SMC/PKR
7. Staff Judge Advocate (or designee)	SMC/JA
8. Comptroller (or designee)	SMC/FM
9. Secretary/Recorder	SMC/SDCA**

* Chairperson

** Non-voting member

Attachment 1-attachment 2**AREA EVALUATION CRITERIA**

An example of how the overall award fee percentage is derived is shown in attachment 3. A weighted score (percent) is derived for the customer satisfaction area and it is combined with the scores for the other two areas of corporate cost and corporate management.

The following standards of performance shall be employed in determining whether and to what extent Aerospace has earned or may be entitled to receive any award fee:

Excellent: Aerospace performance of virtually all contract task requirements is uniformly well above standard and exceeds the standard by a substantial margin with innumerable significant tangible or intangible benefits to the government (i.e., improved quality, responsiveness, timeliness or generally enhanced effectiveness of operations). There are few areas for improvement; these areas are minor; there are no recurring problems; and management has initiated effective corrective action whenever needed.

Very Good: Aerospace performance of most of the contract task requirements is uniformly well above standard and exceeds the standard in many significant areas. Although some areas may require improvement, these are minor and are more than offset by better performance in other areas. Few, if any, recurring deficiencies have been noted in the contractor's performance and the contractor has demonstrated/taken satisfactory corrective action. Innovative management actions have resulted in tangible or intangible benefits to the government (i.e., improved quality, responsiveness, timeliness or generally enhanced effectiveness of operations).

Good: Aerospace performance of most contract task requirements meets the standard, and it exceeds the standard in several significant areas. While the remainder of the Aerospace effort generally meets contractor requirements, areas requiring improvement are more than offset by better performance in other areas. Management actions taken or initiated have resulted in some demonstrated benefits to the government (i.e., improved quality, responsiveness, timeliness, or effectiveness of operations).

Satisfactory: Aerospace performance meets most contract standards. Although there are areas of good or better performance, these are more or less offset by lower rated performance in other areas. Little additional tangible benefit is observable due to Aerospace effort or initiative.

Unsatisfactory: Aerospace performance is below standard in several areas. Aerospace performance IAW requirements is inconsistent. Quality, responsiveness, timeliness, and/or economy in many areas require attention and action. Corrective actions have not been taken or are ineffective. Overall unsatisfactory performance shall not be given award fee.

Area A: Customer Satisfaction

Attachment 1-attachment 2

SSDR 800-7, Aerospace Corporation Performance Evaluation Reports, indicates the evaluation criteria to be used to evaluate the area of customer satisfaction. AFSC Form 1641 (Aerospace Performance Evaluation Report) is modified to require a numerical point score rating (1-100) for each category evaluated.

Area B: Corporate Management

This Category considers, but is not limited to, the following factors:

- a. Effectiveness of Management Approach. Contractor ability to provide an efficient organization with the necessary mix of technical expertise, leadership and guidance.
- b. Problem solving. Contractor ability to anticipate, identify and develop solutions to problems.
- c. Responsiveness. Contractor ability to respond to program requirements with special emphasis on timeliness and quality.
- d. Initiative and Cooperation. Contractor ability to interrelate with Government and Industry to develop rapport that results in mutually agreeable methods of attaining mission objectives.

I. SATISFACTORY (26-50)

- a. Management approach and leadership usually provide a responsive organization, accommodate personnel turnover and maintain adequate technical skills to satisfy specific TO&P tasking.
- b. Establishes clear lines of authority and provides effective communication with all SMC offices, as well as other agencies. Minimal programmatic or technical impacts experienced because of communication problems.
- c. Overall corporate planning is comprehensive and contains a logical flow of activities. Requirements are anticipated and systematically addressed.
- d. Implements management control systems that provide for identification of problems to the appropriate management level. Clearly defines problems with factual supporting information and rationale.
- e. Responsive to the government in supporting technical, schedules and cost issues. Responds to government direction in compliance with industry standards and modes of operation. Demonstrates positive cooperation, and initiative.

II . GOOD (51-75)

- a. Substantially meets the requirements of I above, plus:

- b. Responsive to government technical and business management requests
- c. Management identifies problems, causes and solutions which have a potential for impact on cost, schedule or performance.
- d. Management initiates and promotes strong two-way communication with government counterparts. Seeks continual interaction with government representatives on contract status, goals and objectives and coordinates with the appropriate government personnel to ensure contractor interpretation of contract tasking is correct.

III. VERY GOOD (76-90)

- a. Substantially meets the requirements of II above, plus:
- b. Plays a key role in identifying issues and recommendations for overall contract improvements.
- c. Demonstrates initiative and foresight in planning for potential problems, analyzing impacts, resolving problems and instituting prompt corrective actions. Contractor's positive management control over problem areas results in early problem resolution and minimal impacts.
- d. Continuously reviews non-SPO dedicated labor resource allocations in order to minimize labor usage, while maintaining adequate staffing levels to maintain schedule, and adequate quality of work and maximum productivity.

IV. EXCELLENT (91-100)

- a. Substantially meets the requirements of III above, plus:
- b. Management demonstrates the highest degree of foresight into planning, depth of analysis, accomplishment of tasks, advance identification of problems and problem resolution. Proposed solutions consistently minimize cost and schedule impacts.
- c. Consistently anticipates and responds to government needs. Identifies high-risk/problem areas early, plans alternative/parallel courses of action, and keeps the government well informed of developments.
- d. Develops an effective, efficient contractor team which reflects strong, open lines of communication. Improvements to the planned program result from high quality communication with all government offices and other external focal points (i.e., DCAA, DCMDW, etc) with no program impacts attributed to poor communication.
- e. Contractor's team consists of highly qualified and motivated personnel with an emphasis on productivity and responsiveness. The individual effectiveness level of MTS assigned to a program is consistently appropriate. Minimizes changes of key individuals at the program office level.

Area C: Corporate Cost

This category considers, but is not limited to, the following factors:

- a. Cost control. Contractor's ability to control costs.
- b. Data. Contractor's ability to submit data in a timely manner as requested by the government.

I. SATISFACTORY (26-50)

- a. Meets minimum requirements of the contract.
- b. Usually demonstrates efficient use of resources - in most instances is able to control costs which can be affected by the contractor.
- c. Monthly status reports and other CDRL requirements are usually submitted within the time limits specified.
- d. Usually demonstrates conscientious control over all expenditures, including efforts to avoid cost growth.

II. GOOD (51-75)

- a. Substantially meets the requirements of I above, plus:
- b. Cost reports are submitted with reasonable traceability within and between reports. Adjustments or other perturbations are fully and clearly explained.
- c. Takes measures to avoid unreasonable cost growth (i.e., overhead, salaries, etc.). Corrective actions are briefed to the contracting officer and are generally accepted without changes.
- d. Cost data is consistent and logical and based on overall contract requirements. Significant variations between cost elements and requirements, and their effects are adequately explained. Contractor recognizes where cost growth may be occurring and provides timely documented justification of issues which may require application of additional resources.

III. VERY GOOD (76-90)

- a. Substantially meets the requirements of II above, plus:
- b. Contractor prepares and develops graphic program cost and schedule data which provides a corporate level assessment with clear program office visibility into current and forecast program costs and schedules. Significant variances are adequately explained and corporate management action has been undertaken to resolve the issue.

Attachment 1-attachment 2

c. Contractor performs necessary corporate contingency planning and keeps close and timely communication with the government on cost and schedule issues.

d. Plans, develops and executes viable procedures that incorporate the flexibility necessary to be responsive to changing priorities and schedules without adversely affecting overall contract cost and completion schedule. Executes innovative resource management and planning to minimize any adverse impact on the contract.

e. Provides advanced notification of administrative actions that significantly affect costs, (i.e., in the areas of salaries, general overhead etc.), in sufficient time for evaluation prior to effectivity.

IV. EXCELLENT (91-100)

a. Substantially meets the requirements of all III above, plus:

b. Consistently anticipates possible sources of cost growth and seeks ways to avoid potential cost problems. Proposes innovative and thoroughly cost effective approaches to issues with which the Contracting officer agrees.

c. Cost management system identifies issues and solutions to maintain cost and manpower levels below the negotiated levels.

Sample Award Fee Calculation

COMPUTATION OF AWARD FEE

Performance Criteria	Weight Point Score	Evaluation Score Earned	Percent Earned Percent	Weighted
Customer Satisfaction	70	87	87%	60.9%
Corporate Management	15	85	85%	12.8%
Corporate Cost	15	40	30%	4.5%
Total		<hr/> 100		<hr/> 78.2%

FORM 1641

AEROSPACE CORPORATION PERFORMANCE EVALUATION REPORT (1 Jul 94 - 30 Jun 95)		DATE	SPO																
PROGRAM	JON:	RATING (%) 76 - 100	26 - 75																
			0 - 25																
I. EVALUATE (Check one of the ratings at right for each item.)																			
1. EFFECTIVENESS OF AEROSPACE MANAGEMENT APPROACH																			
2. PROBLEM SOLVING ABILITY																			
3. RESPONSIVENESS TO PROGRAM NEEDS																			
4. ADEQUACY OF AEROSPACE SUPPORT																			
(A) AEROSPACE PROGRAM OFFICE																			
(B) SUPPORTING AEROSPACE DIVISIONS																			
5. TECHNICAL COMPETENCE AND OBJECTIVITY																			
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CUSTOMER SATISFACTION CRITERIA

1. Effectiveness of Aerospace Management Approach: The Aerospace management level to be evaluated should be the Aerospace Counterpart of the Air Force evaluator. Includes the evaluation of Aerospace management in providing: A cost effective and efficient organization; the necessary mix of technical expertise; the leadership and guidance given to their staff.

- | | | |
|-------------------|---------|--|
| a. Above Standard | | Management approach and leadership consistently |
| Excellent | 91-100% | provide a responsive organization, minimize personnel |
| Very Good | 76-90% | turnover problems (within Aerospace's purview), and |
| | | maintain all necessary technical skills to support |
| | | specific TO&P tasking. |
| b. Meets Standard | | Management approach and leadership usually provide |
| Good | 51-75% | a responsive organization, accommodate personnel |
| Satisfactory | 26-50% | turnover (within Aerospace's purview), and maintain |
| | | adequate technical skills to satisfy specific TO&P |
| | | tasking. |
| c. Below Standard | | Management approach and leadership fail to provide a |
| Unsatisfactory | 0-25% | responsive organization, or accommodate personnel |
| | | turnover (within Aerospace's purview), or fails to |
| | | maintain adequate technical skills to satisfy specific |
| | | TO&P tasking. |

2. Problem Solving Ability: Includes the demonstrated ability of Aerospace personnel to develop solutions to problems that: Draw upon expertise in all relevant skills; incorporate the latest state of the art; keep within established cost and schedule limits.

- | | | |
|-------------------|---------|--|
| a. Above Standard | | Problem solving ability is demonstrated by an |
| Excellent | 91-100% | innovative systems approach which considers all |
| Very Good | 76-90% | aspects of a problem. Proposed solutions consistently |
| | | minimize program cost and schedule impacts. |
| b. Meets Standard | | Problem solving usually considers all aspects of a |
| Good | 51-75% | problem. Proposed solutions normally minimize |
| Satisfactory | 26-50% | program cost and schedule impacts. |
| c. Below Standard | | Below Standard - Problem solving fails to consider one |
| Unsatisfactory | 0-25% | or more critical aspects of problems. Proposed |
| | | solutions fail to minimize program cost and schedule |
| | | impacts. |

3. Responsiveness to Program Needs: Includes Aerospace response to program requirements with special emphasis on timeliness and quality.

- | | |
|-------------------|--|
| a. Above Standard | Consistently anticipates and responds to program needs |
|-------------------|--|

Excellent	91-100%	and recognizes potential problems. Program requirements are systematically addressed and all suspenses are met.
Very Good	76-90%	
b. Meets Standard		
Good	51-75%	Anticipates program requirements which are then systematically addressed. Suspenses are normally met.
Satisfactory	26-50%	
c. Below Standard		
Unsatisfactory	0-25%	Program requirements are not anticipated and systematically addressed, or suspenses are late or incomplete.

4. Adequacy of Aerospace Support: Includes evaluation of the appropriateness and effectiveness of all members of the technical staff (MTS) assigned to a program or project which is the responsibility of the Air Force.

a. Above Standard		
Excellent	91-100%	Aerospace MTS skills assigned to a program or project are consistently appropriate for the project. In addition the individual effectiveness level of MTS assigned to a program is consistently appropriate. Together, the skill mix and effectiveness level of Aerospace MTS support your program in an efficient and effective manner.
Very Good	76-90%	
b. Meets Standard		
Good	51-75%	MTS skills and effectiveness levels selected to support a program are normally appropriate. MTS skill mix and effectiveness levels adequately support programs.
Satisfactory	26-50%	
c. Below Standard		
Unsatisfactory	0-25%	MTS skill mix or effectiveness levels are inadequate to support programs. Program support is inefficient or inadequate.

5. Technical Competence and Objectivity: Includes the evaluation of technical, scientific, and engineering abilities of Aerospace MTS.

a. Above Standard		
Excellent	91-100%	Aerospace consistently demonstrates credible and highly objective technical abilities relative to planning factors, technical recommendations, and problem solutions.
Very Good	76-90%	
b. Meets Standard		
Good	51-75%	Aerospace normally demonstrates credible and objective technical abilities relative to planning factors, technical recommendations and problem solutions.
Satisfactory	26-50%	
c. Below Standard		
Unsatisfactory	0-25%	Aerospace fails to demonstrate credible or objective technical abilities relative to planning factors, technical recommendations, or problem solutions.

6. Initiative and Cooperation of Supporting Team: Consider the performance of the entire Aerospace Corporation team assigned to a specific program or project as specified by your TO&P.

- | | | |
|-------------------|---------|---|
| a. Above Standard | | Aerospace consistently displays high standards of initiative and cooperation. Problem areas are identified well in advance of program impacts. Aerospace support team enthusiasm always contributes to success. |
| Excellent | 91-100% | |
| Very Good | 76-90% | |
| b. Meets Standard | | Aerospace usually demonstrates positive cooperation, initiative and enthusiasm. Program success has not been enhanced by support team enthusiasm. |
| Good | 51-75% | |
| Satisfactory | 26-50% | |
| c. Below Standard | | Aerospace fails to demonstrate positive cooperation or initiative. Program success has not been enhanced by support team enthusiasm. |
| Unsatisfactory | 0-25% | |

7. System Program Office (SPO)/Aerospace Working Relations:

a. Management Level - This includes the evaluation of the Aerospace counterparts of the evaluator.

- | | | |
|-------------------|---------|---|
| 1) Above Standard | | Management level working relations are consistently professional and businesslike. Working relations contribute positively to program success. Communication is good. |
| Excellent | 91-100% | |
| Very Good | 76-90% | |
| 2) Meets Standard | | Management level working relations normally contribute to program success. |
| Good | 51-75% | |
| Satisfactory | 26-50% | |
| 3) Below Standard | | Management level working relationships are often characterized by lack of communication and often do not contribute to program success. |
| Unsatisfactory | 0-25% | |

b. Working level - Includes the ability of Aerospace employees to work with their Air Force (and Industry) counterparts to develop a rapport resulting in mutually agreeable methods of attaining mission objectives in a team relationships.

- | | | |
|-------------------|---------|---|
| 1) Above Standard | | Working level rapport consistently promotes open communication and program success. |
| Excellent | 91-100% | |
| Very Good | 76-90% | |
| 2) Meets Standard | | Working level rapport normally contributes to program success. |
| Good | 51-75% | |
| Satisfactory | 26-50% | |

- | | |
|--|--|
| 3) Below Standard
Unsatisfactory 0-25% | Working level rapport is often characterized by failures to communicate and does not contribute positively to program success. |
|--|--|

8. Work Force Capability:

a. Key people - Includes evaluation of the productivity, leadership, and initiative provided by those Key Aerospace MTS who interface directly with the SPO.

- | | |
|--|---|
| 1) Above Standard
Excellent 91-100%
Very Good 76-90% | Key Aerospace members consistently display superior productivity, leadership, and initiative. Leadership consistently contributes to program success. |
| 2) Meets Standard
Good 51-75%
Satisfactory 26-50% | Key Aerospace members are normally productive and display effective leadership and initiative. Leadership contributes to program success. |
| 3) Below Standard
Unsatisfactory 0-25% | Key Aerospace members fail to provide constructive leadership and initiative. Leadership does not contribute to program success. |

b. Supporting MTS - Includes evaluation of those matrix MTS tasked by the Aerospace Program Office to provide specific engineering and scientific support.

- | | |
|--|---|
| 1) Above Standard
Excellent 91-100%
Very Good 76-90% | Supporting Aerospace members consistently display superior productivity, leadership, and initiative. Leadership consistently contributes to program success. |
| 2) Meets Standard
Good 51-75%
Satisfactory 26-50% | Supporting Aerospace members normally display adequate productivity and constructive leadership and initiative. Leadership normally contributes to program success. |
| 3) Below Standard
Unsatisfactory 0-25% | Supporting Aerospace members are nonproductive or fail to provide constructive leadership and initiative. Leadership does not contribute to program success. |

9. Visibility of Aerospace Support: Evaluate the degree of visibility The Aerospace Corporation provides to you of current and planned Aerospace activities for each program or project. Consider the adequacy of information provided by Aerospace.

- | | |
|--|--|
| a. Above Standard
Excellent 91-100%
Very Good 76-90% | Formal reports prepared per SMC FFRDC User Guide (FUG) and TO&P tasking. Informal reports consistently provided timely and accurate program status information. Program schedules and plans are updated and current. |
|--|--|

- | | | |
|-------------------|--------|---|
| b. Meets Standard | | Formal reports prepared per SMC FUG and TO&P |
| Good | 51-75% | tasking. Provided timely and accurate program status |
| Satisfactory | 26-50% | information. |
| c. Below Standard | | Aerospace reports and status briefings are insufficient |
| Unsatisfactory | 0-25% | to track program progress. |

10. Technical Accomplishments: Evaluate the results realized through technical inputs from Aerospace for your program or project.

- | | | |
|-------------------|---------|--|
| a. Above Standard | | Aerospace technical accomplishments and inputs |
| Excellent | 91-100% | consistently make major contributions to program |
| Very Good | 76-90% | success. |
| b. Meets Standard | | Aerospace technical accomplishments and inputs |
| Good | 51-75% | normally contribute positively to program success. |
| Satisfactory | 26-50% | |
| c. Below Standard | | Aerospace technical accomplishments and inputs fail to |
| Unsatisfactory | 0-25% | contribute to program success. |

11. Overall Quality of Aerospace Effort: Your evaluation for this area should consider all the salient aspects of Aerospace support including subjects which may not have been included above. Consider the overall effect of Aerospace performance on your program.

- | | | |
|-------------------|---------|--|
| a. Above Standard | | Overall, Aerospace performance has consistently and |
| Excellent | 91-100% | positively contributed to program success. |
| Very Good | 76-90% | |
| b. Meets Standard | | Overall, Aerospace performance has normally |
| Good | 51-75% | contributed to program success. |
| Satisfactory | 26-50% | |
| c. Below Standard | | Overall, Aerospace performance has not significantly |
| Unsatisfactory | 0-25% | contribute to program success. |

AWARD FEE STANDARD DEFINITIONS

The following ratings shall be applied as subjective assessments of Aerospace performance on each of the eleven Customer Satisfaction Criteria:

- 1. UNSATISFACTORY (0-25%):** Minimum contract requirements have not been satisfied and management has been ineffective and/or non-responsive to program needs. Performance requires significant improvement in one or more areas.
- 2. SATISFACTORY (26-50%):** Contractor performance has met all contract requirements. Management performance has been generally effective and responsive to program needs. Acceptable performance, but improvements desired in one or more areas.
- 3. GOOD (51-75%):** Substantially meets requirements of 2 above, plus contractor performance has met all contract requirements and exceeded contract requirements in some areas, however, with additional emphasis in some areas, performance could demonstrate higher management effectiveness and responsiveness to program needs.
- 4. VERY GOOD (76-90%):** Substantially meets requirements of 3 above, plus contractor performance meets or exceeds contract requirements in most areas. Performance demonstrates higher management effectiveness and responsiveness to program needs in some areas.
- 5. EXCELLENT (91-100%):** Substantially meets requirements of 4 above, plus contractor performance is exceptionally high and exceeds basic contract requirements to a substantial degree in almost all areas. Management performance has also been extremely effective and responsive to program needs in all areas.

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FORMAT FOR CUSTOMER SATISFACTION SHEET

OFFICE SYMBOL_____ **INTERIM**_____ **AWARD FEE**_____ (check box)

1. Effectiveness of Management Approach

*Strengths (Indicate level of importance for each point with asterisks). Provide major strong points of Aerospace performance using criteria provided in the SMC FFRDC User Guide with specific examples that support the rating shown. Summarize with bullet statements.

* Weaknesses (Indicate level of importance for each point). Provide major weak points of Aerospace performance using criteria provided in the SMC FFRDC User Guide with specific examples that support the rating shown. Summarize with bullet statements.

2. Problem Solving Ability and Cost Control

- * Strengths
- * Weaknesses

3. Responsiveness to Program Needs

- * Strengths
- * Weaknesses

4. Adequacy of Aerospace Support

4a. Aerospace Program Office

- * Strengths
- * Weaknesses

4b. Supporting Aerospace Divisions

- * Strengths
- * Weaknesses

5. Technical Competence and Objectivity

- * Strengths
- * Weaknesses

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6. Initiative and Cooperation of Supporting Teams

- * Strengths
- * Weaknesses

7. SPO/Aerospace Working Relations

7a. Management Level

- *Strengths
- * Weaknesses

7b. Working Level

- * Strengths
- * Weaknesses

8. Work Force Capability

8a. Key People

- * Strengths
- * Weaknesses

8b. Supporting MTS

- * Strengths
- * Weaknesses

9. Visibility of Aerospace support

- * Strengths
- * Weaknesses

10. Technical Accomplishments

- * Strengths
- * Weaknesses

11. Overall Quality of Aerospace Support

- * Strengths
- * Weaknesses

FOR OFFICIAL USE ONLY

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**BRIEFING SLIDE EXAMPLE
FORM AT FOR
CUSTOMER SATISFACTION BRIEFING
OFFICE SYMBOL _____
_____ % [Insert Numerical Rating]**

INTERIM _____ AWARD FEE _____ [Check appropriate box.]

1. EFFECTIVENESS OF MANAGEMENT APPROACH

[Example. Use a slide for each Customer Satisfaction Criteria]

STRENGTHS (Indicate level of importance for each point)

Provide major strong points of Aerospace performance for each criteria provided in SM C FFRDC User Guide with specific examples that support the rating shown. Bullets only.

WEAKNESSES (Indicate level of importance for each point)

Provide major weak points of Aerospace performance for each criteria provided in SM C FFRDC User Guide with specific examples that support the rating shown. Bullets only.

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Example of a Customer Satisfaction Tasking Letter

MEMORANDUM FOR AEROSPACE CUSTOMERS

FROM: SMC/AX

SUBJECT: Request for FY 97 Aerospace Award Fee Performance Evaluations

1. All Aerospace customers must complete the Aerospace Corporation award fee performance evaluations for the period 1 Jan 97 - 31 June 97. Please provide your inputs in MS WORD 6.0 format to SMC/AXC (Attn: Mr. Paul Kocincki) by e-mail. If you can not access Mr. Kocincki's e-mail, please provide the evaluations in hardcopy and disk in MS WORD 6.0 format. The evaluations are due COB 31 Jul 1997.

2. Unlike in the past, each major user (SMC two letter program director or agency equivalent) will have the option to assess the performance of the FFRDC at the major user or at the major program level. The major user will not be required to provide a performance evaluation for each TO&P. The minimum requirement is a single, summary evaluation at the major user level. For example, SMC/CL, Launch Vehicles, may submit a single, summary evaluation at the SMC/CL level or several summary evaluations at the major program (Atlas, Titan, Delta) level. The SMC FFRDC User Guide, Annex 8 (Atch 1) provides guidance on this process.

3. Each major user will assess Customer Satisfaction and submit the following documents to SMC/AXC based on the criteria contained in SMC FFRDC User Guide, Annex 8 (Atch 1):

a. A completed AFMC Form 1641 (Atch 2). This form has been modified from the "below standard, meets standard, above standard" ratings to the Award Fee Standards ratings ranging from "unsatisfactory" to "excellent." The correlation between the old AFMC Form 1641 Performance Rating, the Award Fee Standards Rating and the Numerical Rating to be placed on the form by the major user is as follows:

Old Performance Rating	Award Fee Standards Rating	Numerical Rating
Above Standard (76%-100%)	Excellent	91-100%
	Very Good	76-90%
Meets Standard (26-75%)	Good	51-75%
	Satisfactory	26-50%
Below Standard (0-25%)	Unsatisfactory	0-25%

Complete the form by rating each of the eleven Customer Satisfaction Criteria (Atch 3) using the above Numerical Ratings (0-100%) according to the Award Fee Standards Definitions (Atch 4).

b. A completed Customer Satisfaction Sheet (Atch 5). Complete a Customer Satisfaction Sheet, summarized at the major user (or major program) level, with examples for each of the eleven Customer Satisfaction Criteria. This Customer Satisfaction Sheet should support the Numerical Ratings in the AFMC Form 1641 above. Use one or two clear bullet statements to

Attachment 7

indicate major strengths and weaknesses for each criteria. Use bullets only; do not use sentences. Use asterisks to show the level of importance of the strengths and weaknesses as follows:

*Minor

** Moderate

***Major

c. A completed set of Customer Satisfaction Briefing Slides (Atch 6). Summarize the data on the Customer Satisfaction Sheet, above, on the briefing slides at the major user (or major program level). The two letter program director, agency equivalent, or designee will brief these slides to the ARB/FDO.

d. An example of a completed, major user package is at Attachment 7.

4. An e-mail version of this letter and all attachments will be sent to each 2-letter. Use the forms provided in this package to prepare your response. Submit hardcopy and disk versions, if e-mail address (KocinckiPB@post6.laafb.af.mil) cannot be reached, to:

SMC/AXC
Attn: Paul Kocincki
160 Skynet Street, Suite 2315
Los Angeles AFB, CA 90245-4683

5. If there are any questions regarding the evaluations, please contact Mr. Paul Kocincki at (310) 363-2533 or DSN 833-2533.

CHARLES E. WHITED, Colonel, USAF
Deputy Director for Systems Acquisition

7 Attachments

- 1. SMC FFRDC User Guide, Annex 8**
- 2. AFMC Form 1641**
- 3. Customer Satisfaction Criteria**
- 4. Award Fee Standards Definitions**
- 5. Customer Satisfaction Sheet**
- 6. Customer Satisfaction Briefing Slides**
- 7. Example of a Completed, Major User Package**

cc: SMC/AXC
Aerospace Corporation

**EXAMPLE OF COMPLETED MAJOR USER PACKAGE
CUSTOMER SATISFACTION (SPO)**

JON_1493,1496,1503,1534

SPO OFFICE SYMBOL_CLM_____INTERIM____AWARD FEE_X____

REPORT COMPLETED BY_Lt Col Tucker____REPORT REVIEWED BY_Lt Col Rensing____
(FAE) (FAC)

1. Effectiveness of Management Approach

*Strengths (***)

Consistently provides a highly effective organization with the proper blend of technical skills to support the Atlas program. Superior job of supporting the requirements for AREP (multiple CDRs, PDTs, technical evaluations) with limited personnel.

An excellent job prioritizing tasks despite the continuing manpower and budget reductions.

* Weaknesses

None Observed

2. Problem Solving Ability and Cost Control

* Strengths (***)

Outstanding. Resolved a seven year old issue with prime contractor--developed an innovative approach to develop loads combination equation using Monte Carlo techniques. Convinced contractor to agree and significantly improved launch vehicle availability with more realistic models.

* Weaknesses

None Observed

3. Responsiveness to Program Needs

* Strengths (***)

Excellent job of anticipating and responding to program needs. Provided exceptional support to the constantly changing Atlas Reliability Enhancement Program. All suspenses were meet and the right information was provided at the right time.

* Weaknesses

None Observed

4. Adequacy of Aerospace Support

4a. Aerospace Program Office

* Strengths (***)

Attachment 8

Program Office provides super support to the Atlas SPO. Great job of providing the correct level and skill mix to meet program needs.

* Weaknesses

None Observed

4b. Supporting Aerospace Divisions

* Strengths (***)

The technical staff continues to provide excellent support to Atlas. Their knowledge is outstanding and their support is always there when required by our program.

* Weaknesses

None Observed

5. Technical Competence and Objectivity

* Strengths (***)

Their technical competence is without equal. Their insight and knowledge into the Atlas launch vehicle are primary reasons for the success of our engine reliability program. Their identification of corrective actions and quality improvement measures were brilliant. Aerospace brings solutions to the table, not problems or issues.

* Weaknesses

None Observed

6. Initiative and Cooperation of Supporting Teams

* Strengths (**)

A valued member of the AREP product development teams. Ideas and expertise are welcomed by other team members. Also, at the request of the prime contractor, Aerospace played a critical role in the transition of the Castor IV production program from Alabama to Utah.

* Weaknesses

None Observed

7. SPO/Aerospace Working Relations

7a. Management Level

*Strengths (***)

Excellent communication and a business-like approach are the foundation for a superb working relationship at the management level. Aerospace fosters a team approach which results in a very congenial and productive work environment.

* Weaknesses
None Observed

7b. Working Level

* Strengths (**)

An area of improvement. At the working levels, Aerospace is now more integrally involved in the Atlas program and working more productively with their Air Force and contractor counterparts. The agreement on a loads combination equation is just one example of the improved working relationship.

* Weaknesses
None Observed

8. Work Force Capability

8a. Key People

* Strengths (***)

Absolutely the best. Depth of knowledge and experience are the key factors which make the Aerospace MLV Program Office unique and highly effective in solving Atlas launch vehicle problems. Made many valuable contributions to the success of the program.

* Weaknesses
None Observed

8b. Supporting MTS

* Strengths (***)

The engineering staff continue to provide superior productivity and initiative. Their focused inputs were invaluable in resolving a long standing disagreement on the Atlas loads combination equation and in providing inputs on the "hot boattail" issue.

* Weaknesses
None Observed

9. Visibility of Aerospace support

* Strengths (***)

Excellent visibility into the planned activities and usage of MTS. Formal reports are always timely, accurate, and complete. The MLV leadership make it their business to stop by and discuss any changes or new ideas with the Air Force.

* Weaknesses
None Observed

10. Technical Accomplishments

* Strengths (***)

Aerospace technical inputs were very valuable and instrumental in the success to date for AREP. Their suggestions for solving valve design problems, test program content, and electronic piece parts selection were vital to maintaining progress on the program. Could not have done it without their support.

* Weaknesses

None Observed

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CUSTOMER SATISFACTION - BRIEFING
SPO OFFICE SYMBOL - SMC/CL
94%

1. Effectiveness of Aerospace Management Approach - 92%

Strengths

- Extremely cooperative throughout the year especially on manning or funding requests ***
- Management is extremely effective in identifying and resolving critical issues ***

Weakness

- Need to improve support in technical meetings where programmatic decisions are made *

2. Problem Solving Ability and Cost Control - 95%

Strengths

- Exceptional Problem Solving ability; Examples include S stage II engine skirt test, IUS flight controller Centaur avionics, Delta guidance, Squib Fire Circuits ***

Weakness

- Tend to de-emphasize the cost of problem solving solutions *

Example Only

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AEROSPACE CORPORATION PERFORMANCE EVALUATION REPORT (1 Jul 95 - 30 Jun 96)			DATE 15 JUL 96	SPO CL																
PROGRAM ATLAS II	JON:1493/1496 1503/1534	RATING (%) 76 - 100	26 - 75	0 - 25																
I. EVALUATE (Check one of the ratings at right for each item.)																				
1. EFFECTIVENESS OF AEROSPACE MANAGEMENT APPROACH		99																		
2. PROBLEM SOLVING ABILITY		96																		
3. RESPONSIVENESS TO PROGRAM NEEDS		98																		
4. ADEQUACY OF AEROSPACE SUPPORT																				
(A) AEROSPACE PROGRAM OFFICE		98																		
(B) SUPPORTING AEROSPACE DIVISIONS		96																		
5. TECHNICAL COMPETENCE AND OBJECTIVITY		99																		
6. INITIATIVE AND COOPERATION OF SUPPORTING TEAM		95																		
7. SPO/AEROSPACE WORKING RELATIONS																				
(A) MANAGEMENT LEVEL		98																		
(B) WORKING LEVEL		95																		
8. WORKFORCE CAPABILITY																				
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**PROCESS INSTRUCTION FOR AEROSPACE FFRDC CONTRACT USER
SURVEILLANCE****I. PURPOSE.**

The purpose of this Annex is to outline the procedures to implement the surveillance of the FFRDC contract users in accordance with AFMCI 64-103.

II. SURVEILLANCE PROCEDURES.

In order to execute the AFMCI 64-103 at SMC for the Aerospace Corporation FFRDC contract, the following responsibilities are identified.

- a. Senior Technical Official (STO) responsibilities will be performed by the SMC/AXC Program Manager.
- b. ACO responsibilities will be performed by the SMC/AXC PCO. The PCO will determine which responsibilities to designate to the ACO.
- c. The SMC/AXC Program Manager and PCO will conduct periodic surveillance of the major users of the Aerospace Corporation FFRDC contract. An example of a Training Package which includes surveillance training for FAEs and FACs is at Attachment 1.

PowerPoint presentation entitled TNG-BRF.ppt (Training Briefing)

Slide 1 &
2

**TRAINING
FOR
FUNCTIONAL AREA CHIEFS (FAC)
AND
FUNCTIONAL AREA EVALUATORS (FAE)
TO UTILIZE
AEROSPACE SUPPORT**

SMC/AXC

OVERVIEW

- PURPOSE OF TRAINING
- WHAT IS AN FFRDC
- REFERENCES
- DEFINITIONS
- RESPONSIBILITY OF EACH SMC PROGRAM OFFICE
- FAC RESPONSIBILITIES
- DECISION TREE FOR TASK ALLOCATION
- MTS TASK ALLOCATION APPROVAL PROCEDURE
- DDR&E CORE WORK FOR FFRDCs
- SAF/AQ FFRDC CORE FUNCTION DEFINITIONS
- TECHNICAL OBJECTIVES & PLANS PREPARATION INSTRUCTIONS
- AEROSPACE AWARD FEE PERFORMANCE EVALUATIONS

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OVERVIEW (Cont.)

- AEROSPACE AWARD FEE PERFORMANCE EVALUATION REPORT (FORM 1641)
- PERFORMANCE RATING DEFINITIONS
- FAE RESPONSIBILITIES
- SURVEILLANCE FOLDERS
- FM CONTROLLER RESPONSIBILITIES
- PHILLIPS LAB RESPONSIBILITIES
- TEAM MEMBERS
- FORMULATION OF FISCAL YEAR PROGRAM
- REPORT REQUIREMENTS
- CONCLUSION

PURPOSE OF TRAINING

- TO DEVELOP A WORKING UNDERSTANDING OF HOW TO OBTAIN, UTILIZE, AND MANAGE THE AEROSPACE MEMBERS OF THE TECHNICAL STAFF (MTS) RESOURCE.
- TO UNDERSTAND WHAT FEDERALLY FUNDED RESEARCH AND DEVELOPMENT CENTER (FFRDC) IS AND WHAT AEROSPACE PROVIDES.

5 & 6

WHAT IS AN FFRDC?

- **PRIVATE PUBLIC-SERVICE ORGANIZATION MANAGED BY INDUSTRIAL, ACADEMIC, OR OTHER NON-PROFIT ENTITIES**
 - ESTABLISHED AT GOVERNMENT'S REQUEST: SAF/AQ IS THE SPONSORING AGENT.
 - PROVIDES TECHNICAL EXPERTISE OF A TYPE AND CHARACTER WHICH CANNOT BE PROVIDED AS EFFECTIVELY BY ANY OTHER SECTOR: GOVERNMENT, ACADEMIC OR COMMERCIAL.
 - USE OF THE FFRDC IS GOVERNED BY THE CRITERIA AND GUIDANCE CONTAINED IN SMC FFRDC USERS GUIDE.

REFERENCES

- **AFMCI 64-103, ADMINISTRATION OF CONTRACTS AWARDED TO FEDERALLY FUNDED RESEARCH AND DEVELOPMENT CENTERS.** ESTABLISHES POLICY FOR ADMINISTERING CONTRACTS AWARDED TO FFRDCs.
- **SMC FFRDC USERS GUIDE, THE AEROSPACE (FFRDC) TECHNICAL SUPPORT, PERFORMANCE EVALUATION CRITERIA AND THE AWARD FEE PLAN IMPLEMENTS THE AFMCI 64-103 POLICY.**
- **FEDERAL ACQUISITION REGULATION (FAR) 35.017** FFRDCs STATES THE REGULATORY CRITERIA FOR ESTABLISHING, CONTINUING AND TERMINATING AN FFRDC.

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DEFINITIONS

- **ALLOCATIONS**-MTS AUTHORIZED FOR EACH PROGRAM/PROJECT
- **MEMBER OF THE TECHNICAL STAFF (MTS)** - PROFESSIONAL, SCIENTIST OR ENGINEER ACTIVELY AND DIRECTLY ENGAGED ON PERFORMANCE DEVELOPMENT PLANNING, SYSTEM ENGINEERING, RESEARCH AND EXPERIMENTATION, AND TECHNICAL SUPPORT
- **TECHNICAL OBJECTIVES AND PLANS (TO&P)** - PROJECT SPECIFIC STATEMENT OF WORK
- **FUNCTIONAL AREA CHIEF (FAC)** - THE GOVERNMENT REPRESENTATIVE RESPONSIBLE FOR A FUNCTIONAL AREA IN WHICH SERVICES ARE PROVIDED
- **FUNCTIONAL AREA EVALUATOR (FAE)** - THE GOVERNMENT REPRESENTATIVE, SELECTED BY THE FAC, IS RESPONSIBLE FOR MONITORING, EVALUATING AND DOCUMENTING AN FFRDC'S PERFORMANCE ON SPECIFIC CONTRACT REQUIREMENTS

DEFINITIONS (Cont'd)

- **ENABLING CLAUSES** - AGREEMENT CONTAINED IN ALL MAJOR SMC CONTRACTS. IT ALLOWS AEROSPACE TO OBTAIN TECHNICAL INFORMATION FROM A COMPANY THAT IS OF A PROPRIETARY NATURE. IT ALSO ASSURES THE CONTRACTOR THAT THE INFORMATION WILL NOT BE DIVULGED
- **CONFLICT OF INTEREST CLAUSE** - CONTAINED IN THE AEROSPACE CONTRACT AND PROHIBITS AEROSPACE FROM DIVULGING ANY INFORMATION OBTAINED
- **CORE WORK** - CERTIFY THAT THE WORK FALLS WITHIN THE DDR&E DEFINITION OF CORE WORK FOR AN FFRDC. IT IS WITHIN THE AEROSPACE MISSION, IT USES THE AEROSPACE CORE COMPETENCIES, AND IT COMPLIMENTS THE STRATEGIC RELATIONSHIP BETWEEN THE AIR FORCE AND AEROSPACE. IN ADDITION, ALL THE TASKS FALL WITHIN THE TWENTY-THREE SAF/AQ CORE FUNCTIONS. INDIVIDUALS HAVE TO CERTIFY EACH YEAR

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RESPONSIBILITY OF EACH SMC PROGRAM
OFFICE

REF. SMC FFRDC USERS GUIDE (ANNEX 1)

- **DETERMINES AND JUSTIFIES REQUIREMENTS FOR AEROSPACE SUPPORT IAW SMC FFRDC USERS GUIDE (ANNEX 3) AND AFMCI 64-103** (SEE FAC/FAE RESPONSIBILITIES)
 - ACCOMPLISH TASKS IN-HOUSE WHEN APPROPRIATE RESOURCES ARE AVAILABLE
 - ACQUIRE SERVICES THROUGH COMPETITIVE PROCUREMENT WHEN AEROSPACE EXPERTISE IS NOT REQUIRED AND IN-HOUSE RESOURCES ARE NOT AVAILABLE
 - COORDINATE PROPOSED AEROSPACE TASKING (TASKS REQUIRING UNIQUE AEROSPACE CAPABILITY) THROUGH APPROPRIATE IN-HOUSE FUNCTIONAL EXPERTS TO DETERMINE WHETHER IN-HOUSE PERSONNEL OR NON-FFRDC CONTRACTORS CAN ACCOMPLISH THE TASKING IN LIEU OF AEROSPACE

RESPONSIBILITY OF EACH SMC PROGRAM
OFFICE (Cont'd)

- **FAC/FAE RESPONSIBILITIES**
 - REVIEW SMC FFRDC USERS GUIDE (ANNEX 3) TO DETERMINE AND LIST BY NUMBER, ANY OF THE ELEVEN CRITERIA THAT ARE APPLICABLE AS JUSTIFICATION FOR SOLE-SOURCE WORK. CERTIFY THAT ONLY THE FFRDC CAN DO THE WORK.
 - CERTIFY THAT THE WORK FALLS WITHIN THE DDR&E DEFINITION OF CORE WORK FOR AN FFRDC AND THAT THE TASKS FALL WITHIN THE TWENTY -THREE SAF/AQ CORE FUNCTIONS.

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RESPONSIBILITY OF EACH SMC PROGRAM
OFFICE (Cont'd)

- **BUDGETS, ALLOCATES AND PROVIDES FUNDS TO SMC/FM UPON REQUEST**
 - DEVELOP SPECIFIC AND CLEAR TO&P TASKING THAT CAN BE USED TO PREPARE AN INDEPENDENT MTS ESTIMATE PRIOR TO ASSIGNING TASKS
 - DEVELOP INDEPENDENT MTS COST ESTIMATES AND USE THE ESTIMATE AS A BASIS FOR VERIFYING THAT THE COSTS CLAIMED BY THE FFRDC ARE ACCURATE AND REASONABLE
 - DOCUMENT AND MAINTAIN RATIONALE FOR COST ESTIMATES
- **PREPARES, COORDINATES AND REVISES TECHNICAL OBJECTIVES AND PLANS** (SEE FAC/FAE RESPONSIBILITIES)

RESPONSIBILITY OF EACH SMC PROGRAM
OFFICE (Cont'd)

- **MONITORS AEROSPACE MTS DELIVERIES, COSTS AND PERFORMANCE** (SEE FAC/FAE RESPONSIBILITIES)
 - PERFORM MONTHLY COST REASONABLENESS CHECKS
 - USE INDEPENDENT GOVERNMENT COST ESTIMATES
 - ENSURE THAT COSTS ARE REASONABLE COMPARED TO THE LEVEL OF SUPPORT RECEIVED BY OBSERVATION
 - REVIEW THE MONTHLY STATUS AND COST REPORTS
 - REPORT DISCREPANCIES TO SMC/AXC AND THE PCO
 - REVIEW MANPOWER CHARGES BY NAME

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RESPONSIBILITY OF EACH SMC PROGRAM
OFFICE (Cont'd)

- FFRDC MONTHLY SURVEILLANCE FOLDERS (CONTENTS)
 - SMC FFRDC USERS GUIDE (ANNEX 9)
 - SURVEILLANCE RECORDS
 - PERFORMANCE REPORTS
 - TO&Ps
 - CDRL ITEMS
- PROVIDES SEMI-ANNUAL EVALUATION OF AEROSPACE PERFORMANCE IAW SMC FFRDC USERS GUIDE (ANNEX 8) AND THE AWARD FEE PLAN (SEE FAC/FAE RESPONSIBILITIES)
 - ENSURE ADEQUATE DETAIL INCLUDED IN THE TO&P TO PERMIT AN OBJECTIVE EVALUATION OF ASSIGNED TASKS

RESPONSIBILITY OF EACH SMC PROGRAM
OFFICE (Cont'd)

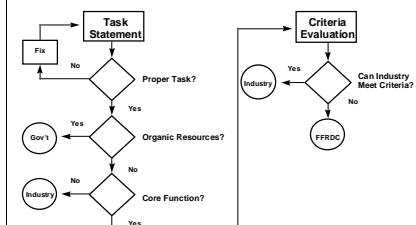
- PROGRAM MANAGERS MUST ADEQUATELY AND OBJECTIVELY EVALUATE FFRDC TECHNICAL PERFORMANCE
- COMMENTS IN PERFORMANCE REPORTS TO BE RELATED TO SPECIFIC TASKS IN THE TO&P
- BELOW STANDARD RATINGS MUST BE ACCOMPANIED BY A STATEMENT OF PROPOSED CORRECTIVE ACTION, INCLUDING CORRECTIVE ACTION TAKEN.

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FAC RESPONSIBILITIES
(REF SMC FFRDC USERS GUIDE (ANNEX 1))

- DETERMINES AND JUSTIFIES AEROSPACE REQUIREMENTS
- ASSURES TO&P TASKS ARE CLEAR AND SPECIFIC, MUST CORRELATE TO ESTIMATE OF MTS NEEDS, AND ALLOW OBJECTIVE EVALUATION OF AEROSPACE PERFORMANCE (SEE SMC FFRDC USERS GUIDE (ANNEX 8) AND THE AWARD FEE PLAN)
- REVIEWS, ACCEPTS/APPROVE, IN CONSONANCE WITH THE FAE, PROCESSES TECHNICAL OPERATING REPORTS
- WHEN DELEGATED BY THE SPO DIRECTOR AND IN CONSONANCE WITH THE FAE, PROVIDES TECHNICAL GUIDANCE TO THE AEROSPACE DIRECTOR
- ASSIGNS THE FAE AND IDENTIFIES APPOINTED FAEs TO THE CHIEF ENGINEER AND SMC/AXC
- ENSURES FAEs HAVE RECEIVED TRAINING ON APPROPRIATE GUIDANCE DOCUMENTS

Decision Tree for Task Allocation



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MTS TASK ALLOCATION APPROVAL PROCEDURE

- **New Procedures for approval of Aerospace tasks**
 - Is the task a proper FFRDC task: Is this work the organization really needs performed by an FFRDC? Is the task properly prepared in the Scope of Work section on the Technical Objectives & Plans (TO&P) form?
 - Can the task be performed by Organic sources?
 - Is the task DR&E Core Work? Is the task one or more of the twenty three, permitted SAF/IAQ FFRDC Core Functions?
 - Is the task justified as a Sole Source effort IAW the eleven criteria in the SMC FFRDC USERS GUIDE (ANNEX 3)?
 - Can industry meet the above criteria & therefore preclude an FFRDC from doing the work?

MTS TASK ALLOCATION APPROVAL PROCEDURE
(Cont.)

- The preceding decision process requires each requesting government official to sign the following **Certification Statement** which must be included on each TO&P:
 - "I certify that the positions (MTS) I am requesting from the Aerospace Corporation have been reviewed according to the following steps:
 - 1. I have reviewed the work to see if it is work that actually needs to be done. I have then analyzed the work to see if it could be done by organic resources, industry at large, or SETAs. I certify that only the FFRDC can do this work.
 - 2. I have reviewed the Sponsoring Agreement and have determined that the following criteria are applicable justification for sole source work:

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**MTS TASK ALLOCATION APPROVAL PROCEDURE
(Cont.)**

- [See SMC FFRDC USERS GUIDE (ANNEX 3) and list by number any of the eleven criteria that are applicable to the TO&P]
- 3. I certify that the work falls within the DDR&E definitions of Core Work for an FFRDC: It is within the Aerospace mission, it uses the Aerospace Core Competencies, and it complements the strategic relationship between the Air Force and Aerospace. In addition, all the tasks fall within the twenty three SAF/AQ FFRDC Core Functions.
- Signature Block and Signature

DDR&E CORE WORK FOR FFRDCs

- Appropriate in view of Aerospace's mission (support to USAF)
- Supports the strategic (long term) USAF/Aerospace relationship
 - Broad, deep knowledge of space technologies/systems
 - Detailed knowledge of space systems in use or in development
 - Able to apply processes for architectures, acquisition, T&E
 - Understanding the operational role of the systems
 - Substantial involvement with developers, users, fielders
- Must exercise core competencies:
 - Launch certification
 - System of systems engineering
 - Systems development and acquisition
 - Process implementation
 - Technology application

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SAF/AQ FFRDC CORE Function Definitions

1. **Acquisition Planning, Preparation, and Evaluation.** This includes support in preparation of solicitation documents (source selection plan, RFP, technical requirements documents, WBS, etc.) and provision of technical advisors to source selection. Specific activities include evaluation of the contractor's proposal and required documentation as requested by the Air Force to accomplish the requirements selection criteria for the system, subsystem or task.
2. **Systems Architecture Planning and Development.** Includes items such as broad concepts studies, systems opportunities, systems roadmaps and supporting technology roadmaps. Particular emphasis on "systems of systems" approaches and interoperability and joint operations. Create reference designs for purposes of analysis and program planning.
3. **Technical Performance Analysis and Assessment.** The continuing verification of the degree of anticipated and actual achievement of a technical parameter. Independent analysis/detection of design flaws and technology problems with resolution alternatives (physical process) tailored to program needs.

SAF/AQ FFRDC CORE Function Definitions (Cont.)

4. **Independent Technical Analysis.** Independent analysis of the technical performance or progress of a program, system, subsystem or component assessed against its technical or contractual requirements. Application of special knowledge and expertise to explicit operational problems. Other independent analyses such as system design, failure, problem detection and resolution, environmental impact assessments, monitoring, and abatement technology
5. **Operational Requirements Analysis and Evaluation.** Iterative requirements analysis and flowdown with the customer. Matching program technical requirements with mission requirements. Resolution of conflicting requirements. Evaluation of the degree of mission accomplishment in either a simulated or planned operational environment
6. **Integration Management.** Independent analyses and evaluation of systems internal and external interfaces. As part of the systems of systems approach, it includes interaction among associated systems.

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SAF/AQ FFRDC CORE Function Definitions (Cont.)

7. **Risk Assessment and Management.** The identification and analysis of potential problems in order to quantify and assess risks, and to implement or control the appropriate approach for handling each risk identified.
8. **Modeling and Simulation.** All hardware and software effort to model operational systems throughout system life cycle. Includes architecture and systems of systems modeling and simulation developments.
9. **Proof-of-Concept Prototyping.** Prototyping used in Demonstration and Validation and Engineering and Manufacturing Development to understand requirements and assist in identifying and reducing risk associated with emerging technologies, applications, and interfaces.

SAF/AQ FFRDC CORE Function Definitions (Cont.)

10. **Program, Milestone, and Design Reviews.** Includes all formal and informal technical reviews and milestones such as SDR, PDR, CDR, etc. These may be conducted incrementally or at major review points. Support includes review of deliverables, independent analysis as required and ATP recommendation. Includes reviews conducted to ensure the system is ready for its next phase of development.
11. **Technology Requirements, Applications, and Research.** State of the art assessments. Assessment of technology opportunities. Technology alternatives and risk assessments versus program needs. Selective, specialized, in-depth analysis and state of the art improvement in critical, system technologies. Mission oriented investigation and experimentation (MOIE). Evaluations of the application of available technology to development programs.
12. **Trade Studies.** Analyses conducted to evaluate trade-offs among stated user requirements, design, program schedule, functional performance requirements, and life cycle cost.

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SAF/AQ FFRDC CORE Function Definitions (Cont.)

13. **Test Planning, Execution and Analysis.** Review of the contractual requirements to support the tests which will verify that system and items satisfy their specification requirements. Review of procedures, pass-fail criteria, test articles, and test configuration. Independent analysis as required. Assessment of manufacturing process integrity and changes. Assessment of first of a kind repairs.
14. **Acquisition Process Improvements.** Efforts necessary to support both Acquisition Reform initiatives such as Military Specifications and Standards Reform, and interoperability.
15. **Test Review and Witness.** Reviews conducted to evaluate the completeness of the execution of test requirements for systems and sub-assemblies. Independent verification of test integrity and validity.

SAF/AQ FFRDC CORE Function Definitions (Cont.)

16. **Mission and Threat Analysis.** Analysis of existing and potential missions as well as existing and potential threats to support the development of products and processes for operational use. Independent analysis and exploitation of intelligence products for systems. Threat assessment packages tailored to program life cycle needs.
17. **Independent Testing.** In-house conduct of the hardware and software testing to verify and validate test concepts, procedures, and methodologies.
18. **Readiness Reviews.** A variety of independent reviews used to ensure that the configuration item or system is either ready for testing, ready for production at the completion of Engineering & Manufacturing Development, or in the case of space systems, launch, mission, or system operations

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SAF/AQ FFRDC CORE Function Definitions (Cont.)

19. **Laboratory Testing** Tests conducted to explore or verify performance (e.g., that a prototype is ready for entry into Engineering And Manufacturing Development)
20. **Monitoring Launch Vehicle and Satellite Processing and Certifying Launch Readiness.** Validation of in-line processing of flight hardware. Adequacy of projected range support. Formal certification of adequacy of processing and readiness for flight. Additional support to mission and launch readiness reviews.
21. **Sustaining Engineering.** Engineering inputs to fix or improve operations and maintenance capability for existing systems or proposed architectures. System design for supportability.

SAF/AQ FFRDC CORE Function Definitions (Cont.)

22. **Program Systems Engineering.** Includes requirements development, systems engineering planning, and establishing and supporting process for integration of requirements flowdown, performance, and design alternatives. Analysis and insight into subsystem and system design and integration, requirements flowdown, design, performance and cost trades.
23. **Multi-Program Systems Engineering.** Horizontal engineering between programs, lessons learned, technology commonality and other items. As part of the systems of systems approach it includes interaction among associated space systems. Includes independent analysis and evaluation of system interfaces and functions as required to assure system integrity and reliability.

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**TECHNICAL OBJECTIVES AND PLANS (TO&P)
PREPARATION INSTRUCTIONS**
(DERIVED FROM SMC FFRDC USERS GUIDE (ANNEX 3))

- **Each TO&P shall include the following:**
 - **Title:** A short title of the program or activity.
 - **Program Objectives:** a brief description of the Air Force's, (or other sponsoring agency's) broad objectives for the program or activity.
 - **Program Management:** Identify SMC's or other organization's responsibility in managing this program. Reference and pertinent documents.
 - **Responsibility of the Aerospace Corporation:** Identify the category or categories of work for which Aerospace is responsible on the program or activity (GSE&I, TR, SRDT&E, P&SA....). These are selected from the list of work categories embodied in the contract Statement of Work.

TO&P PREPARATION INSTRUCTIONS (Cont.)

- **Contractors:** List contractors whose performance Aerospace must review.
- **Scope of Work:** The scope of Aerospace GSE&I work will be defined by citing SMC FFRDC USERS GUIDE (ANNEX 2) and listing the tasks which require major emphasis. Specific exceptions will be stated also. For other categories of work specific tasks, lists should be formulated using tasks from SMC FFRDC USERS GUIDE (ANNEX 2), as applicable. The tasks should sufficiently define the work so that the responsible Air Force and Aerospace personnel can, within the normal working relationship, carry out their assignments. terminology such as "as requested" shall not be used in the TO&P. Procedural, administrative or financial information shall not be included.

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TO&P PREPARATION INSTRUCTIONS (Cont.)

- **Special Requirements:** List special requirements for reports or facilities, etc., if applicable.
- **Level of Effort:** Include the following statement, "The level of effort is as agreed to and recorded in the contract files of Aerospace and SMC."
- **Statement:** The certification statement, as stated previously under Procedures, must be included and signed.

AEROSPACE AWARD FEE PERFORMANCE EVALUATIONS

- The Aerospace award fee performance evaluations will be provided IAW the criteria contained in SMC FFRDC Users Guide (Annex 8) and the Award Fee Plan performance rating definitions. AFSC Form 1641 has been modified to provide for numerical ratings (0 - 100%). The AFSC Form 1641 rating and standard award fee rating scale correlate as follows:

- AFSC Form 1641 Rating	Award Fee Rating Scale
- Above Standard (76-100%)	Excellent (81-100%)
-	Very Good (76-90%)
- Meets Standard (26-75%)	Good (51-75%)
-	Satisfactory (26-50%)
- Below Standard (0-25%)	Unsatisfactory (0-25%)

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AEROSPACE AWARD FEE PERFORMANCE EVALUATIONS (Cont.)

- Each organization shall coordinate their evaluations through their 2-letter office or the appropriate agency focal point. Ratings shall be required for each of the eleven evaluation categories shown on Form 1641 and must include 1 or 2 clear, bullet type statements indicating major strengths and/or weaknesses to support each of your ratings, including asterisks to show the level of importance for each bullet as follows:

- *	Minor	**	Moderate	***	Major
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 - Any weaknesses identified should be or have been discussed with the appropriate Aerospace counterpart and an effort made in sufficient time to resolve the problem.

AEROSPACE CORPORATION PERFORMANCE EVALUATION REPORT (FORM 1641)

AEROSPACE CORPORATION PERFORMANCE EVALUATION REPORT (FORM 1641)		DATE	BY
1. AEROSPACE CORPORATION NAME			
2. AEROSPACE CORPORATION ADDRESS			
3. AEROSPACE CORPORATION CITY			
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37 & 38

SURVEILLANCE FOLDER

- THE FAE WILL:
 - MONITOR AEROSPACE PERFORMANCE AND MAINTAIN SURVEILLANCE RESULTS (AEROSPACE COST STATUS REPORTS, PERFORMANCE EVALUATION REPORTS - FORM 1641, TRACK PROGRESS OF AEROSPACE CORRECTIVE ACTIONS
 - BRING PROBLEMS PROMPTLY TO THE ATTENTION OF THE FAC, PCO AND AEROSPACE

SURVEILLANCE FOLDER (Cont.)

- SURVEILLANCE FOLDER TO INCLUDE:
 - TAB 1 INDEX
 - TAB 2 SURVEILLANCE LOG
 - EXCEPTION MEMOS
 - CORRESPONDENCE
 - TAB 3 MONTHLY STATUS REPORTS
 - MONTHLY COST REPORTS
 - TAB 4 PERFORMANCE EVALUATION NOTES
 - SEMI-ANNUAL PERFORMANCE EVALUATION SUBMISSIONS
 - TAB 5 TECHNICAL OBJECTIVES & PLANS (TO&P)
 - TAB 6 SMC FFRDC USERS GUIDE

39 & 40

SMC/FM CONTROLLER RESPONSIBILITIES
(REF. SMC FFRDC USERS GUIDE)

- PROVIDES FUNDS ON A REIMBURSABLE BASIS WHICH ARE OBLIGATED TO THE CONTRACT
- OBTAINS FUNDING FROM SMC PROGRAM OFFICES AND USER AGENCIES

PHILLIPS LAB (PL) RESPONSIBILITIES
(REF. SMC FFRDC USERS GUIDE)

- INITIATE THE FISCAL YEAR MOIE PLAN AND COORDINATING WITH THE SMC PROGRAM OFFICES
- PERFORM OVERSIGHT MANAGEMENT
- CONDUCT SEMI-ANNUAL PERFORMANCE EVALUATIONS IAW SMC FFRDC USERS GUIDE (ANNEX 8) AND THE AWARD FEE PLAN
- COORDINATE CHANGES TO MOIEs WITH THE CHIEF ENGINEER

41 & 42

TEAM MEMBERS AND TO&P SIGNATORIES

- TEAM MEMBERS
 - FAC
 - FAE
 - SMC/AXC-PROGRAM MANAGER/FFRDC
 - CONTRACTING OFFICER-PCO
- TO&P SIGNATORIES
 - AIR FORCE SPO/AGENCY REPRESENTATIVE
 - AEROSPACE PROGRAM/PROJECT OFFICE
 - AIR FORCE CONTRACTING OFFICER
 - THE AEROSPACE CORPORATION

FORMULATION OF FISCAL YEAR PROGRAM
(REF. SMC FFRDC USERS GUIDE (ANNEX 3))

- SMC/AX: ISSUES CALL FOR MTS REQUIREMENTS (FEB)
- STLO: ASSIGNS SPO PROJECT MANAGERS TO DETERMINE MTS NEEDS
- STLO: REVIEWS/SUBMITS TO SMC/AX ON FORM 1640 (MAR)
- SMC/AX: REVIEWS/CONSOLIDATES ALL INPUTS (APR)
- SMC/AX: REQUESTS AEROSPACE TO REVIEW (APR)
- AEROSPACE: CONDUCTS COMPARATIVE ANALYSIS NOTING CONCERNS/RECOMMENDATIONS (APR)
- SMC/AX: REVIEWS WITH STLO AND FINALIZES STLO NEEDS (APR)
- AEROSPACE: ADVISES ON VIABILITY OF ESTIMATED MTS DELIVERIES (APR)

43 & 44

FORMULATION OF FISCAL YEAR PROGRAM
(REF. SMC FFRDC USERS GUIDE (ANNEX 3))

- SMC/AX: PRESENTS MTS REQUIREMENTS BRIEFING TO SMC/CC (MAY)
- SMC/CC: MAKES DECISION REGARDING NUMBER OF MTS NEEDS (MAY)
- SMC/AX: BRIEFS SAF/AQ, DECISION MADE REGARDING NUMBER OF MTS AND DOLLAR CEILING (MAY)
- SMC/AXC: NEGOTIATES/AWARDS/ADMINISTERS AEROSAPCE CONTRACT (FY CYCLE)

REPORT REQUIREMENTS

- ALL FORMAL REPORTS-BY CONTRACT CDRL
- FOR REPORTS RESULTING FROM TO&P REQUIREMENTS
 - FAE MAINTAINS LIST
 - FAE MUST BE MADE AWARE OF CHANGES IN REPORT DUE DATE, BY CONTRACTOR; FAE MUST AGREE
 - LIST WITH RECEIVED REPORTS CHECKED OFF MUST BE AVAILABLE FOR AUDIT REVIEW

45 & 46

CONTRACT DATA REQUIREMENTS LIST

- | | | |
|---------|----------------------------|---------------|
| • 001A2 | MONTHLY STATUS REPORT | 18TH OF MONTH |
| • 002A2 | MANAGEMENT DATA REPORT | QUARTERLY |
| • 003A2 | QUARTERLY PROG REPORT | QUARTERLY |
| • 004A2 | COMPUTER/MACHINE PROD | AS REQUIRED |
| • 005A2 | MOIE PLAN/PROG REPORT | YEARLY |
| • 006A2 | TECHNICAL OPER REPORT | AS REQUIRED |
| • 007A2 | TECHNICAL REPORTS | AS REQUIRED |
| • 008A2 | MEDICAL INCID NOTIFICATION | AS REQUIRED |

CONCLUSION

- AEROSPACE IS A VITAL RESOURCE
- IF YOU HAVE ANY QUESTIONS, CONTACT:
 - CONTRACTUAL MATTERS: MRS GLORIS PICKETT-31589
 - MTS REQUIREMENTS: MR PAUL KOCINCKI -32533
 - OVERALL RESPONSIBILITY FOR AEROSPACE TECHNICAL ACTIVITY:
SMC CHIEF ENGINEER - COL CHARLES E. WHITED - 33818

**DEPARTMENT OF DEFENSE
FEDERALLY FUNDED RESEARCH AND DEVELOPMENT CENTER (FFRDC)
MANAGEMENT PLAN
May 1, 1996**

This is a verbatim version of the document. It is included here for convenience to help the FFRDC users.

INTRODUCTION

DoD-sponsored Federally Funded Research and Development Centers (FFRDCs) represent a long-term Government investment in a unique resource for research, systems engineering, and analysis. Over the years FFRDCs have been essential contributors to maintaining the superiority of United States forces. FFRDCs perform work that is: (1) consistent with the center's mission, purpose and capabilities; (2) consistent with DoD's needs as reflected in the center's core competencies; (3) consistent with the strategic relationship between the center and its sponsors; and, (4) cannot be performed as effectively by existing in-house, other not-for-profit non-profit, or for-profit contractor resources.

Because of the importance and unique status of FFRDCs, the DoD must ensure that their use is appropriate and that DoD has effective policies and procedures for their management.

A. PURPOSE

This plan defines DoD policies and procedures for the management and use of DoD-sponsored FFRDCs. It also provides guidelines and procedures for ensuring compliance with the Government-wide policies set forth in Office of Federal Procurement Policy (OFPP) Policy Letter 84-1, *Federally Funded Research and Development Centers*, dated April 4, 1984, and Federal Acquisition Regulation, Part 35.017, entitled *Federally Funded Research and Development Centers*.

B. APPLICABILITY

1. This plan applies to FFRDC primary sponsors, FFRDC users, and contracting activities that award FFRDC contracts.
2. DoD FFRDCs provide high-quality research, systems engineering and analytical work that is within the scope of their defined core work and draws on or sustains the strategic relationship between the FFRDC and its sponsor.
3. In addition to meeting long-term and intermediate needs of sponsors and users, FFRDCs also provide immediate, short-term assistance to address urgent high priority issues.
4. DoD FFRDCs are currently operated by universities or privately organized, non-profit not-for-profit corporations through long-term Government contracts under the authority of 10 U.S.C. 2304(c) (3)(B).

5. FFRDCs are outside the Government to permit the management flexibility necessary to attract and retain high-quality scientists, engineers, and managers, and to provide an independent perspective on the critical issues they address for their sponsors and users.

6. The nature of their mission requires that FFRDCs operate in a strategic relationship with their sponsors and users. Those strategic relationships have the following characteristics:

- a. FFRDCs and sponsors commit to are stable and long-term relationships.
- b. FFRDCs are granted privileged access to Government and contractor information beyond that which is common to the normal contractual relationship, including intelligence data and program planning information.
- c. FFRDCs bear a special responsibility to avoid actual and perceived conflicts of interest, and they accept stringent restrictions on their scope, and method of operations and the kinds of efforts they can undertake either for their sponsors or for other users.

7. Strategic relationships enable FFRDCs to:

- a. Develop maintain and provide in-depth knowledge of their sponsors' programs and operations.
- b. Maintain continuity and currency in their special fields of expertise, and a high degree of competence in their staff and work.
- c. Maintain their objectivity and independence.
- d. Respond to the emerging needs of their sponsors and users.

8. The DoD currently sponsors eleven FFRDCs managed by eight parent organizations (see Appendix A). Each of the eleven FFRDCs fall under one of the three categories of FFRDCs defined by the National Science Foundation. This management plan recognizes the different purposes and contributions by organizations in each category. The distinctions between categories of FFRDCs are an important consideration in the management approach that should be applied to each of them. The three categories as represented in the DoD are:

- a. Studies and Analyses (S&A) Centers: S&A centers deliver independent and objective analyses and to advise in core areas important to their sponsors in support of policy development, decision making, alternative approaches, and new ideas on major defense issues of significance.
- b. Systems Engineering and Integration (SE&I) Centers: SE&I centers provide required support in core areas not available from sponsor's in-house technical and engineering capabilities to ensure that complex systems will meet operational requirements. The centers assist with the creation and choice of system concepts and architectures, the specification of technical system and subsystem requirements and interfaces, the development and acquisition of system hardware and software, the testing and verification of performance, the integration and interoperability of new capabilities, and continuous improvement of system operations and logistics. They often play a

critical role in assisting their sponsors in technically formulating, initiating, and evaluating programs and activities undertaken by firms in the for-profit sector.

c. Research & Development (R&D) Laboratories: R&D laboratories fill voids where in-house and private sector research and development centers were/are unable to meet DoD core area needs. Specific objectives for these FFRDCs are to: (1) maintain over the long-term a competency in technology areas where the Government cannot rely on in-house or private sector capabilities; and (2) develop and transfer important new technology to the private sector so the Government can benefit from a wider, broader base of expertise. R&D laboratories engage in research programs that emphasize the evolution and demonstration of advanced concepts and technology, and the transfer or transition of technology.

C. DEFINITIONS

1. Primary Sponsor. A specified DoD organization will be designated a primary sponsor by the Director Defense Research and Engineering (DDR&E) for each FFRDC (see Appendix A). The primary sponsor is responsible for implementing FFRDC management policies and procedures.

2. Contracting Activity. As referred to in this plan, the DoD contracting activity is the activity that awards a contract or contracts under the authority of 10 U.S.C. 2304 for a FFRDC.

3. User. The user or tasking activity is an entity (DoD or/and non-DoD) that requires the services of a DoD FFRDC for performance of FFRDC work.

4. Core Work. Work appropriate for performance by a FFRDC because it is consistent with the mission, purpose and competencies of the FFRDC, and draws on or sustains a strategic relationship between the FFRDC and its sponsor. having a particular strategic relationship with its DoD sponsor, which is consistent with the mission, purpose and competencies of the FFRDC.

5. Non-FFRDC Work. Work performed by the parent institution that does not comply with the definition of core work, and is, therefore, not performed within the DoD FFRDC(s).

6. Parent Institution. An entity that contracts with the DoD to operate a FFRDC. A parent institution may also be called a parent organization.

D. POLICY

1. Policy for the Performance of Work by DoD-Sponsored FFRDCs and Parent Institutions. DoD sponsors must operate under this policy. Specific implementing instructions shall be documented in the respective sponsoring agreement.

a. FFRDC Work: A DoD FFRDC may only perform core work as defined in its core statement and in accordance with the following guidelines:

(1) All work must be approved by the primary sponsor.

(2) Work may only be accepted from DoD, other Government entities, state and municipal governments, and not-for-profit non-profit activities.

(3) No commercial work may be accepted by a DoD FFRDC.

(4) Exceptions may be made in the interest of national security with primary sponsor approval

b. Non-FFRDC Work: Parent institutions operating DoD FFRDC(s) may perform non-FFRDC work subject to primary sponsor review for compliance with established criteria mutually agreed upon by the primary sponsor and parent institution. The criteria shall be addressed in the Sponsoring Agreement. In establishing these criteria, the following guidelines shall be used by the primary sponsor:

(1) Guidelines:

(a) Non-FFRDC work by parent institutions should be in the national interest, such as addressing economic, social, or governmental issues.

(2b) Non-FFRDC work shall not undermine the independence, objectivity, or credibility of the FFRDC by posing an actual or perceived potential conflict of interest, nor shall it detract from the performance of FFRDC work.

(3c) Non-FFRDC work shall not be acquired by taking unfair advantage of the parent institution's operation of its FFRDC(s) or of information that is available to that parent institution only through its FFRDC(s).

(4d) Non-FFRDC work may be done for public sector and not-for-profit non-profit entities. Commercial work shall not normally be accepted; however, should an exception be granted by the sponsor, such work must be non-proprietary and can not exclusively benefit any individual for-profit entity. No commercial work may be accepted.

(52) There are no specified limits on the volume of non-FFRDC work. However, each FFRDC primary sponsor should periodically annually assess whether the non-FFRDC work performed by the parent institution is impairing its ability to perform its FFRDC work.

(63) Universities operating DoD-sponsored FFRDCs are not restricted from performing non-FFRDC work. Such work must be obtained, however, in a manner compliant with applicable procurement policies to ensure that work is not acquired through an unfair advantage associated with the FFRDC mission, purpose or special relationship. provided the acquisition complies with applicable Federal procurement policy.

c. Technology Transfer Activities. Sponsoring agreements may include authority for Research and Development Laboratory FFRDCs to participate with industry in technology transfer activities when appropriate. Sponsors must include adequate safeguards to ensure the FFRDC remains free of organizational conflicts of interest and that the conditions for establishing and maintaining the FFRDC are not compromised. The safeguards should include specific review and approval of technology transfer work by the FFRDC sponsor on a case-by-case basis.

d. (4) Exceptions. Requests for work performance exceptions (FFRDC and non-FFRDC) shall should be directed to the primary sponsor, Service Acquisition Executive, or the component head, as applicable.

22. FFRDC Level of Effort Funding.

a. DoD-funded Work.

(1) Staff years of technical effort (STEs) shall be used in sizing and managing DoD-funded FFRDC work. Although the total number of STEs available will be constrained by DoD budgetary considerations and statutory requirements, STEs will provide a standard measure across all of DoD's FFRDCs for projecting DoD workload and funding requirements. Appendix B contains the standard definition of STE to be used in computing workload requirements.

(2) The DDR&E will establish a workload ceiling annually by STE for each FFRDC based on: (a) sponsor needs; (b) a determination that those needs require one or more of the core capabilities of the FFRDC; and (c) the general guidelines laid out in subparagraph 2.b. below.

(3) Requests to the DDR&E for deviations from or exceptions to the established STE ceiling for any specific FFRDC shall be presented by the sponsor with appropriate justification. Given the mission of the FFRDCs, staff years of technical effort (STE) is the best measure to be used in sizing FFRDC core work. The DDR&E will annually determine how many STE are allocated for each FFRDC based on several factors, including sponsor needs and the established guidelines for determining workload requirements for each category of FFRDC. From the workload requirement measured in STE, the DDR&E will derive a dollar funding level, taking into account any applicable DoD budgetary considerations as well as statutory requirements.

b. In calculating workload requirements to be delivered during the fiscal year, FFRDCs and their primary sponsors shall use the standard definition of STE and work year as defined in Appendix B. The dollar funding levels will apply to all DoD appropriated funds obligated during the given fiscal year. For this purpose, obligations are defined as the total DoD funds obligated less any offsetting obligations on the contract(s).

c. Requests to the DDR&E for deviations from or exceptions to established ceilings for any specific FFRDC will be presented by the primary sponsor with appropriate justification.

bd. General Guidelines. Annual levels of effort shall be based upon application of the core concept and the following category guidelines. The guidelines to be used by FFRDC primary sponsors in projecting workloads and funding requirements for each of the FFRDC categories are:

(1) Studies and Analyses Centers (S&A)

(a) Maintain a relatively stable level-of-effort.

(b) Maintain competency in core areas.

(2) Systems Engineering and Integration Centers (SE&I)

(a) Maintain stable core competencies.

(b) Respond to projected trends in workload and funding consistent with the budget supporting the mission area. Trend in the most relevant portions of the DoD budget (research and development and/or procurement) supporting the types of programs/systems within the FFRDC mission area.

(3) Research and Development (R&D) Laboratories. Maintain technical expertise and related competencies necessary to address the core work and priorities of the sponsor. The

c. Non-DoD Funded Work. FFRDC work funded using non-DoD appropriations will comply with the same policies and constraints as DoD-funded work and will be reported in accordance with Appendix D.

33. FFRDC Management Fee. FFRDCs are operated by not-for-profit or university affiliated organizations and are strictly limited by DoD in the types of work they may perform. By limiting the work that can be done by a FFRDC, the DoD limits the sources of funds available to the FFRDC to pay costs normally incurred by a business, but not reimbursed under Government cost-type contracts. As a result, fees for FFRDC work may be appropriate. Part of the DoD's responsibility for prudent financial oversight of its FFRDCs is recognition that certain types of spending may be essential to ensure the long-term vitality of an FFRDC and that all private corporations have the need to incur certain expenses in the ordinary course of business. In accordance with the OFPP Policy Letter 84-1, the appropriateness of paying management fees to DoD FFRDCs should be addressed in their sponsoring agreements. When fees are authorized, the following guidelines are to be used.

a. The sponsor/contracting activity must make a determination that a fee is needed. This determination is to be performed annually by evaluating the FFRDC's current Application of Funds and Sources of Funds statements, and considering the following:

(1) Proportion of retained earnings that relates to the DoD contracted effort.

(2) Facilities capital acquisition plans.

(3) Working capital funding assessment based on operating cycle cash needs.

(4) Funding of Provision for funding unreimbursable costs deemed "ordinary and necessary" to the FFRDC's continued successful operation.

b. If a fee is determined to be needed, the sponsor/contracting activity will use the following as guidelines in arriving at the fee amount:

(1) An annual fee proposal justifying each element of fee. The proposal must:

(a) Provide sufficient visibility into each element of fee. Not excessively group elements of fee into a single category.

(b) Avoid the use of undefined and ambiguous terms, such as “miscellaneous” and “other.”

(c) Not include any cost (element of fee) for which reimbursement, either as an incurred cost or as an element of fee, is prohibited by statute. The FFRDC is prohibited by statute from incurring or being charged from fee.

(d) Comply with fee reimbursement restrictions and/or limitations included in the sponsoring agreement and/or applicable statutes and regulations.

(e) Identify, for inclusion as an element of fee, costs not reimbursable under the contract that the FFRDC can nevertheless demonstrate are ordinary and necessary to the FFRDC’s successful operation. Include unreimbursable contract cost items if they can be demonstrated as “ordinary and necessary” to the FFRDC’s successful operation.

(2) The extent to which the prior representations and justifications regarding fee have proven accurate (both as to the fee amount and to the planned uses for the fee). Unexplained or repeated failure to reasonably adhere to planned uses for fee should serve as a basis for challenging either the appropriateness and/or the magnitude of proposed fees.

(3) Costs incurred by the FFRDC that are allowable or allocable under the cost principles (i.e., commercial using FAR 31.2, not-for-profit non-profit using OMB Circular A-122, or university affiliated using OMB Circular A-21), regulations, or statutes applicable to that FFRDC. Costs should be classified as direct or indirect (overhead/G&A) charges to the contract and not included as proposed fee elements. Exceptions may be made to this guideline with primary sponsor approval.

c. These guidelines are not intended to eliminate best practice techniques in applying the applicable cost principles, such as implementation of an award fee concept.

d. Appendix C elaborates on the process to be used in determining the need for fee. Provides examples of FFRDC “ordinary and necessary” expenses and elaborates on the process to be used in determining the need for a fee.

E. RESPONSIBILITIES

1. The Director of Defense Research and Engineering (DDR&E), consistent with the provisions of this plan, is responsible to the Deputy Secretary of Defense through the Under Secretary of Defense for Acquisition and Technology to:

a. Ensure that STEs staff years of effort and funding levels established for each of the FFRDCs are consistent with overall DoD requirements and strategy.

b. Monitor the mechanisms used by FFRDC sponsors to ensure the appropriateness and value of FFRDC efforts and activities.

c. Oversee implementation and execution of this management plan by each FFRDC primary sponsor to ensure compliance. and designated executive agent.

2. The FFRDC Primary Sponsor and Designated Executive Agent shall:

- a. Ensure that each FFRDC is being used only for its intended purposes.
- b. Ensure that the costs of the goods and services it provides are reasonable, and that it produces high-quality work of value to user organizations., and that recipient organizations make appropriate use of that work.
- c. Review descriptions of work proposed to be done by the FFRDC and ensure that the work assigned is consistent with the FFRDC's core statement.
- d. Assure the DDR&E that these provisions are being satisfied by making a specific statement in the Annual Review Assessment required in accordance with Appendix D.

F. PROCEDURES

1. Sponsoring Agreements. Primary sponsors of FFRDCs shall maintain sponsoring agreements. The specific content of these documents may vary depending on the nature of the relationship between the primary sponsor and the FFRDC. Sponsors may supplement sponsoring agreements with operating instructions; however, at a minimum sponsoring agreements must include the following:

- a. Provisions for the orderly termination or nonrenewal of the contract, disposal of assets, and settlement of liabilities. The responsibility for capitalization of the FFRDC must be defined in such a manner that ownership of assets may be readily and equitably determined upon termination of the FFRDC's relationship with its sponsor.
- b. A prohibition against the FFRDC competing with any non-FFRDC concern in response to a Federal agency formal Request for Proposal for other than the operation of a FFRDC. This prohibition is not required to be applied to any parent organization in its non-FFRDC operations. However, sponsoring agencies may expand this prohibition as they determine necessary and appropriate competing with any non-FFRDC concern in response to a Federal agency request for proposal for other than the operation of an FFRDC. This prohibition includes responses to requests for information, qualifications, and/or capabilities by the FFRDC unless approved by the primary sponsor and/or authorized in the Sponsoring Agreement. Also, this prohibition is not intended to preclude laboratory FFRDCs from participation in dual-use technology transfer when appropriate and authorized in their Sponsoring Agreement.
- c. A determination of whether the FFRDC may accept work from other than the primary sponsor. If non-sponsor work can be accepted, a description of the procedures to be followed will be included, along with any limitations as to the non-sponsors from which work can be accepted (e.g., other Federal agencies, State, local or foreign governments, or not-for-profit organizations).
- d. A description of the procedures used to make an annual assessment to evaluate performance in the areas of technical quality, responsiveness, value, cost and timeliness. Also

required is a description of the mechanism used to provide feedback to the FFRDC in order to identify and resolve any perceived or real problems.

e. When cost-type contracts are used, the sponsor should identify any cost elements or fee that require advance agreement and/or approval. Such items may include, but are not limited to personnel compensation, depreciation, various indirect costs such as Independent Research and Development, or others as deemed appropriate by the sponsor.

2. Core Statement. Primary sponsors of FFRDCs shall maintain a current core statement describing the purpose for establishing the FFRDC, the nature of the strategic relationship between the FFRDC and the primary sponsor, and along with a description of its mission, general scope of effort, and the core competencies that the FFRDC must maintain so that it can assist in accomplishing the sponsoring agency's mission. This statement must be specific enough to permit a discrimination between work that is within the scope of effort for which the FFRDC was established and work that should be performed elsewhere.

3. Comprehensive Review. Prior to renewal of the FFRDC contract, the primary sponsor shall conduct a comprehensive review of the continuing use of and need for the FFRDC. This review must comply with Federal Acquisition Regulation, Part 35.017. The resulting determination to approve continuation or termination of the sponsorship shall be made by the head of the sponsoring agency, with the concurrence of the DDR&E, prior to the anticipated contract renewal date. Also, the sponsor shall advise the DDR&E upon the initiation of a required review and the expected date of its completion. At that time, the DDR&E will have the opportunity to advise the sponsor of any special interest items or requirements to be addressed during the review. Appendix E contains guidelines for the conduct of comprehensive reviews. Sponsors are expected to follow the guidelines to ensure consistency and thoroughness in the review process within the DoD.

43. Reports. DDR&E requires specified and ad hoc reports in order to comply with Congressional reporting requirements and to perform necessary oversight functions and responsibilities. The schedule and content of reports and other submissions currently required are shown in Appendix D.

G. EFFECTIVE DATE

This DoD FFRDC Management Plan is effective May 1, 1996 and replaces the DoD FFRDC Management Plan that became effective on October 1, 1994.

APPENDIX A**DoD FEDERALLY FUNDED RESEARCH AND DEVELOPMENT CENTERS****STUDY AND ANALYSIS CENTERS**

CENTER FOR NAVAL ANALYSES, Alexandria, VA
ASN(RD&A): NAVY

SPONSOR:

CNA's work for the Navy, and Marine Corps, and other sponsors is based on its expertise in operations analysis, system requirements and acquisition, resource analysis, program planning, and policy, strategy and doctrine. Its integrated research program encompasses a broad range of issues, including -- for example -- the development and evaluation of tactics, operational testing of new systems, assessment of current capabilities, logistics and readiness, work-force management, space and electronic warfare, cost and operational effectiveness analysis, assessment of advanced technology, force planning, and strategic implications of political-military developments. CNA performs such efforts for DoN, other DoD agencies, and for non-DoD agencies in matters affecting the interests of DoN and DoD encompasses tactics development and evaluation, operational testing of new systems, assessment of current capabilities; logistics and readiness; manpower and training; space and electronic warfare; cost and operational effectiveness analysis, assessment of advanced technology, force planning, and strategic implications of political-military developments. Twenty percent of CNA's analysts are assigned to the Fleet, and field commands on two-year tours.

RAND PROJECT AIR FORCE, Santa Monica, CA

SPONSOR: ASAF/A

Conducts a continuous and interrelated program of objective analyses on major cross-cutting policy and management issues of enduring concern to the Air Force, including studies on preferred means of developing and employing aerospace power; national security threats and strategies; Air Force missions, capabilities, and organizations; strategic and tactical force operations; and technology, support, and resource management.

INSTITUTE FOR DEFENSE ANALYSES (IDA), Alexandria, VA
USD(A&T)OSD

SPONSOR:

Performs studies and analyses for the Office of the Secretary of Defense, Joint Staff, Unified Commands and Defense Agencies in the areas of defense systems, science and technology, strategy and forces, resource analysis, advanced computing and information processing, training, simulation, acquisition process, and the industrial base. Provides analyses of task plans, operational assessments and test results for weapons and other systems, including new and proposed equipment of all types.

RAND NATIONAL DEFENSE RESEARCH INSTITUTE, Santa Monica, CA

SPONSOR:

USD(A&T)OSD

Conducts a wide range of research and analyses in the areas of international security and economic policy; threat assessment; defense strategy and force employment options; applied science and technology; information processing systems; systems acquisition, readiness and support systems; and active-duty and reserve manpower, personnel, and training for the Office of the Secretary of Defense, Joint Staff , Unified Commands, and Defense Agencies.

LOGISTICS MANAGEMENT INSTITUTE, McLean, VA

SPONSOR:

USD(A&T)OSD

Conducts research, studies and analyses for its primary sponsor the Office of the Secretary of Defense, Military Departments, Defense Agencies, Joint Staff, and Unified Commands. Its core mission areas are: in its mission areas: material management, acquisition, installations, environment, operational logistics, facilities and environment, and international programs, force management., and information science.

RAND ARROYO CENTER, Santa Monica, CA
ARMY

SPONSOR: SARDA

Conducts a wide range of research, studies and analyses in the areas of strategy, force design and operations; readiness and support infrastructure; applied science and technology; manpower and training; threat assessment, and Army doctrine.

SYSTEMS ENGINEERING/INTEGRATION CENTERS

AEROSPACE CORPORATION, El Segundo, CA
USAF

SPONSOR: ASAF/A

Performs general systems engineering and integration for DoD space systems. Provides planning, systems definition and technical specification support; analyzes design and design alternatives, interoperability, manufacturing and quality control; and assist with test and evaluation, launch support, flight tests, and orbital operations. Appraises the technical performance of contractors.

MITRE C3I FFRDC, Bedford, MA and McLean, VA
ASD(C3I)OSD

SPONSOR:

Performs general systems engineering and integration for the DoD Command, Control, Communications, and Intelligence (C3I) community. Provides direct support through program

definition; creation of plans and architectures; specification of technical requirements; system integration; analyses of design and design alternatives; integration of new capabilities into existing systems; integration of multiple legacy systems into effective systems of systems; hardware and software review; and test and evaluation. Appraises contractors' technical performance.

RESEARCH AND DEVELOPMENT LABORATORIES

SOFTWARE ENGINEERING INSTITUTE, Pittsburgh, PA
DARPA

SPONSOR:

SEI is charged with bringing technology to bear on rapid improvement of the quality of operational software in software intensive systems; with accelerating the reduction to practice of modern software engineering technology and promulgating the use of this technology throughout the software community; and with fostering standards of excellence for improving software engineering practice.

MIT LINCOLN LABORATORY, Lexington, MA
USAF

SPONSOR: ASAF/A

The laboratory carries out a program of research and development in a number of technologies. Program activities extend from fundamental investigations through design, development, and field test of prototype systems using new technologies.

IDA COMMUNICATIONS AND COMPUTING LABORATORY
Bowie, MD; Princeton, NJ; La Jolla, CA
OSD/NSA

SPONSOR:

Conducts fundamental research for the NSA in (1) cryptology, including the creation and analysis of complex encipherment algorithms, as well as in speech and signal analyses; and (2) various technologies associated with supercomputing and parallel processing including new architectures, hardware, and software (including prototypes), as well as parallel processing algorithms and applications.

APPENDIX B**STAFF YEAR OF TECHNICAL EFFORT (STE)**

In calculating workload requirements to be delivered during the fiscal year, FFRDCs and primary sponsors shall use the standard definition of STE and work year shown below.

An STEs applies to direct professional and consultant labor, performed by researchers, mathematicians, programmers, analysts, economists, scientists, engineers, and others who perform professional-level technical work primarily in the fields of studies and analyses; system engineering and integration; systems planning; program and policy planning and analysis; and basic and applied research.

Minimum educational requirements for STE employees and consultants are a baccalaureate bachelor degree from an accredited college or university. In rare instances, non-degree personnel may be included, but only if they possess the equivalent of a baccalaureate bachelor degree in education and experience, and are performing work of the same type and level as that performed by degree STE employees.

An STE work year is defined to be 1,810 hours of paid effort for technical services. STE work years include both FFRDC employee and subcontracted consultant technical effort. If a cost per STE work year is to be calculated, then accrued FFRDC revenues (and not actual obligations that occurred during the fiscal year) should be divided by the number of STE work years performed by employees and consultants (including subcontracting efforts for technical services).

APPENDIX C

DETERMINATION OF FFRDC NEED FOR A MANAGEMENT FEE AND EXAMPLES
OF FEE USAGE

When the sponsor and contracting activity perform the “need” evaluation, all elements of the FFRDC’s expenses (Application of Funds) should be analyzed and then compared to the projected sources of income (Sources of Funds). As an example, if income exceeded expenses for the prior fiscal year, there would be a surplus to working capital which should be considered in the following year’s determination of fee needs. Such surplus should be evaluated in light of the FFRDC’s working capital needs and its reasonable needs for resources to apply to other uses, such as debt retirement or compliance with financial accounting standards. If, on the other hand, expenses exceeded income for the prior year or are forecasted to do so for the current year, there may be a need to replenish the FFRDC’s available financial resources in order to allow it to continue efficient operations.

The sponsor’s and contracting activity’s recognition of the need for a fee should also consider the benefit provided to the operation and purposes of the FFRDC. Activities that benefit a parent institution corporation as a whole (for example, use of fee to provide working capital to meet the payroll) may be appropriate if there is a benefit to DoD. Conversely, activities whose primary purpose is to benefit or enhance a non-FFRDC corporate parent or affiliate, or to expand the corporation’s work for sponsors other than the DoD, shall not serve as justification for needing a fee or be used in establishing the fee amount.

The Three examples of cost categories that may be used to justify fees and establish fee amounts follow:

1. Working Capital: Fee may reflect the amount of funds necessary to fund the normal business operations of the FFRDC, as assessed on an operating cycle basis. Specifically, fee may reflect the working capital needs of the FFRDC. Working capital represents funds available to the FFRDC to pay current operating expenses (between the time the cost is incurred and reimbursement is received). The FFRDCs may either use their own reserves (to the extent such reserves are in liquid form) or borrow, thereby incurring interest expense, to satisfy the FFRDC’s working capital needs.

2. Facilities Capital: Fee may reflect the costs of fixed asset acquisitions in accordance with capital acquisition plans that are approved by the Government as a part of the annual Fee Justification Proposal. Care should be taken to ensure that the planned capital purchases do not include items that must can be charged to the contract in their entirety at the time of acquisition under the cost principles to which the FFRDC is subject. Every effort should also be made to fully fund capital budget expenditures with capital budget income (depreciation and cost of money), rather than using fee to cover such shortfalls. However, it is recognized that FFRDCs need to be able to acquire the tangible assets necessary for the effective and efficient conduct of their operations. Government and cost accounting regulations and the tax code may require that the cost of these assets be capitalized and recovered through depreciation or amortization over a

period of years, even though the financial resources used to acquire them have to be committed at the time of acquisition. Such capital acquisitions justify fee to the extent of both the timing differences and the need to service and retire debt that may have been incurred in the original acquisition transaction. Conversely, when feasible, capital equipment and real and leasehold improvements should not exceed the depreciation/amortization (equipment and building) and cost of money income.

3. Other Unreimbursed Expense: Fee may reflect costs that will be used by the FFRDC to pay for a variety of other expenses not included in the above two categories. These types of expenses must be “ordinary and necessary” to the operation of the FFRDC and should not include allowable or allocable costs (direct or indirect) that can be charged to the contract. Fee serves as the only source of funds to pay such expenses. However, if there is sufficient justification for including additional expenses in fee, that can be permitted if justified to the satisfaction of the sponsor. In order for these expenses to become appropriate for consideration as a fee need, they must be separately identified and justified in the annual fee proposal. The projected occurrence of such expenses does not in itself justify the allowance of fee; i.e., the FFRDC must establish that the expenses are “ordinary and necessary” for its successful operation.

APPENDIX DREPORTING REQUIREMENTS FOR FFRDC PRIMARY SPONSORS

ANNUAL REPORTING REQUIREMENTS	DUE DATE	DESCRIPTION
Annual Report on Staff Years of Technical Effort (STE) and Funding.	15 November	Provide DDR&E with a report showing funding and STEs and associated funding data (DoD and non-DoD). DDR&E will provide required data call format necessary for: (1) Annual Congressional Reporting; and (2) Budget Estimates.
Mid-Year Status Update	30 April	Provide DDR&E a report for use in monitoring FFRDC obligations (DoD and non-DoD) per the data call format. The report should address the sponsor's ability to use and fund all authorized DoD-funded STEs ceiling; if they anticipate having excess STEs ceiling available; and if they anticipate submission of a request(s) for exception(s).
Annual Review Assessment	30 days after completion of the assessment	Provide to the DDR&E a copy of the annual review assessment. The requirements for an annual assessment may be met by the Comprehensive Review during the year that a comprehensive review is required.
Changes to Sponsoring Agreement, Core Statement, and Operating Instructions	Within 30 days of change implementation	Provide the DDR&E with copies of changes to the Sponsoring Agreements or , Core Statement., and Operating Instructions.
Comprehensive Review Notification	One year prior to Due Date initiation of the Review	Advise the DDR&E of Comprehensive Review initiation. DDR&E will advise the sponsor of any special review requirements.
Comprehensive Review	NLT 90 days prior to renewal of the FFRDC contract current sponsoring agreement termination date	Provide to the DDR&E the results of the Comprehensive Review for the use and need of the FFRDC in accordance with this Plan (see Appendix E), OFPP Policy Letter 84-1, and FAR Part 35.017. DDR&E concurrence is required prior to renewal of the FFRDC contract.

APPENDIX E**COMPREHENSIVE REVIEW GUIDELINES FOR
DoD-SPONSORED
FEDERALLY FUNDED RESEARCH AND DEVELOPMENT CENTERS**

PURPOSE: The purpose of the comprehensive review is to formally analyze the use and need for the FFRDC in order to assist the head of the sponsoring agency in with determining whether to continue sponsorship of the FFRDC.

This appendix provides the guidelines for reporting the results of FFRDC comprehensive reviews in accordance with this management plan, OFPP Policy Letter 84-1, and the FAR.

- Identify the FFRDC, its primary sponsor and contracting activity. Include the date and term of the FFRDC's current sponsoring agreement.
- Provide a detailed examination of the sponsor's special technical needs and mission requirements that are being performed by the FFRDC to determine whether, if and at what level, they should continue to exist (FAR 352.017-4 (c)(1)).

Identify requirements for FFRDC support including known specific programs involved, the level of effort required and the types of tasks to be performed.

- Consideration of alternative sources (FAR 35.107-4(c)(2)):

Specify the special research, systems development, or analytical needs, skills, and/or capabilities involved in accomplishing FFRDC tasks.

Explain why the capabilities cannot be provided as effectively by in-house personnel, for-profit or not-for-profit non-profit contractors, university-affiliated organizations, or another existing FFRDC. Include statements on the alternatives to the FFRDC that were considered and the rationale for not selecting each of them.

- Provide a detailed assessment of the efficiency and effectiveness of the FFRDC in meeting a sponsor's/user's needs including the FFRDC's ability to maintain its objectivity, independence, quick response capability, currency in its field(s) of expertise, and familiarity with the needs of its sponsor (FAR 35.017-4(c)(3)).

Include a summary of FFRDC accomplishments and their effectiveness in meeting user needs since the last comprehensive review. As a minimum, the quality and timeliness of the work produced, the number and dollar value of projects and programs assessed, and the user evaluations of performance should be addressed. A summary of the results of the most recent annual review should be included. All major users should participate in this portion of the comprehensive review. Discuss any criticisms or concerns that the users had with FFRDC performance and the steps taken to resolve those issues.

- Conduct an assessment of the FFRDC management controls to ensure cost-effective operation (FAR 35.017-4(c)(4)).

Discuss accounting and purchasing systems; overhead costs and fees; oversight actions taken to verify cost-effective operations; and other management issues as deemed appropriate.

- Provide a determination that the criteria for establishing the FFRDC is satisfied and that the sponsoring agreement is in compliance with FAR 35.017, FAR 35.017-2, and the DoD Management Plan. Include a statement addressing each of the criteria. Provide a certification that the current sponsoring agreement accurately reflects the mission of the FFRDC.

Discuss agreements between the Government and the FFRDC. These agreements may cover such items as authorization of fees, provision of Government facilities and equipment, distribution of residual assets of settlement and liabilities in event of dissolution, maintenance of specific cash reserves, and waivers to accounting policies or regulatory requirements.

- The comprehensive review should provide a recommended course of action and be signed by the head of both the sponsoring and contracting agency(ies). DDR&E concurrence with the results of the comprehensive review is required prior to renewal of the contract or termination of the FFRDC.

NON-FFRDC ACTIVITIES

This section describes some basic rules and processes related to non-FFRDC activities performed by the Aerospace Corporation.

I. Ground Rules: Section I is taken from the DoD FFRDC Management plan of May 1, 1996 which covers non-FFRDC efforts of the parent organization that manages an FFRDC.

Non-FFRDC Work: Parent institutions operating DoD FFRDC(s) may perform non-FFRDC work subject to primary sponsor review for compliance with established criteria mutually agreed upon by the primary sponsor and parent institution. The criteria shall be addressed in the Sponsoring Agreement. In establishing these criteria, the following guidelines shall be used by the primary sponsor:

1. Non-FFRDC work by parent institutions should be in the national interest, such as addressing economic, social, or governmental issues.
2. Non-FFRDC work shall not undermine the independence, objectivity, or credibility of the FFRDC by posing an actual or perceived conflict of interest, nor shall it detract from the performance of FFRDC work.
3. Non-FFRDC work shall not be acquired by taking unfair advantage of the parent institution's operation of its FFRDC(s) or of information that is available to that parent institution only through its FFRDC(s).
4. Non-FFRDC work may be done for public sector and not-for-profit entities. Commercial work shall not normally be accepted; however, should an exception be granted by the sponsor, such work must be non-proprietary and can not exclusively benefit any individual for-profit entity.
5. There are no specified limits on the volume of non-FFRDC work. However, each FFRDC primary sponsor should periodically assess whether the non-FFRDC work performed by the parent institution is impairing its ability to perform its FFRDC work.
6. Universities operating DoD-sponsored FFRDCs are not restricted from performing non-FFRDC work. Such work must be obtained, however, in a manner compliant with applicable procurement policies to ensure that work is not acquired through an unfair advantage associated with the FFRDC mission, purpose or special relationship.

II. ADDITIONAL GROUND RULES

A. Non-FFRDC activities of the Aerospace Corporation consistent with its Articles of Incorporation (i.e. scientific activities in the interest of the U.S. Government) can be conducted under separate contracts with DoD and non-DoD clients.

B. Objectivity and Freedom from Conflict of Interest: Aerospace in its operation of its FFRDC and non-FFRDC activities shall conduct business in a responsible manner befitting the FFRDC's special relationship with the Air Force to: operate in the public interest with objectivity and independence; be free from organizational conflicts of interest; and have full disclosure of FFRDC operations to the sponsoring agency. In order to avoid organizational conflict of interest, the following policies are in place:

1. Non-Manufacturing: The Aerospace Corporation shall not engage in the manufacture, production or sale of any production systems for operational use. The assembly or fabrication of prototypes, or test equipment required to perform development tests, are not included in this prohibition. Any exceptions require sponsor approval.

2. Non-Competition: It is not the Air Force's intent that the Aerospace FFRDC or the Aerospace Corporation use privileged information, access to facilities, or assets obtained through the performance of FFRDC contracts to compete with the private sector. Pursuant to FAR 35.0171(c)(4), neither the Aerospace Corporation nor the Aerospace FFRDC shall compete with any non-FFRDC concern in response to any request for proposal issued by any Federal or international agency. However, the Aerospace Corporation and/or the Aerospace FFRDCs may compete for the formation and operation of an FFRDC, and with other FFRDCs for government work. Any other exceptions require sponsor approval.

3. Industrial and International Work: Work for private sector industrial clients and international organizations responsible for the development, operation and applications of space systems and technologies may be performed by the Aerospace Corporation in order to develop insight into the technology and interoperability of commercial and international space systems as they affect US national security space systems and US global space competitiveness. The Aerospace FFRDC can work for international organizations for the reasons stated above.

C. Neither the Aerospace Corporation nor the Aerospace FFRDC shall disclose sensitive Government or industrial proprietary information coming into its possession to any individual, corporation, or organization, other than its own employees, without proper authorization.

D. All work for the Aerospace Corporation or the Aerospace FFRDC shall be awarded on a Sole Source basis (see attached, Figure 1).

1. All work using the FFRDC Sole Source justification shall be classified as FFRDC activities whether it is done under the AF FFRDC contract(s) or under separate direct contacts with the Aerospace Corporation.

2. All work done under the AF FFRDC contract(s) with the Aerospace Corporation shall be considered FFRDC activities.

3. All non-FFRDC work shall (a) use sole source justification other than the FFRDC sole source justification (b) shall be awarded as contracts directly with the Aerospace Corporation.

E. Aerospace non-FFRDC activities will all draw upon and enhance the core capabilities of the FFRDC and the Corporation. These activities may not all be related to National Security space but they could include the application of space related engineering knowledge/techniques and technology to other fields. Those tasks that do not conform to all FFRDC criteria (Annex 4) can be performed by the Aerospace Corporation.

F. Aerospace will advise the Air Force of any changes in the overall scope of its mission, tasking, or working programs for other organizations, and the potential impact; if any, on the operation of the Aerospace FFRDC. If the Air Force determines that non-FFRDC activities adversely impact FFRDC work, the matter shall be resolved by the SMC Commander and the President of Aerospace.

III. Non-FFRDC customers and AF review processes. The non-FFRDC customers categories for Aerospace can differ and the AF review and/or approval process for each category may also differ.

A. Commercial customers (Domestic or Foreign). The details on the type of activities allowed, and the approval processes and limitations are fully covered in Annex 7. (At a latter date they will be incorporated into this annex).

B. Non-DoD Government and non-profit Customers. These customers include non-DoD government customers at the Federal, State, or local level, non-profits and Universities. Work that meets all the criteria of non-FFRDC work will require no in-line AF approval process prior to initiating contract activities and performing tasks. The Aerospace Corporation must submit a list of these activities on an annual basis. The Aerospace Corporation will maintain documentation records that are used internally in deciding if the work is proper. These may be requested by the AF/SMC/AX if there are questions about any one of the specific activities listed.

C. Foreign Governments or non-profit organizations. This type of work will follow the process outlined in B above. Work for international clients will be undertaken consistent with government regulations for export licensing and technology transfer.

D. DoD Activities. DoD work that does not fully conform to the Aerospace's FFRDC criteria but do conform to the general rules outlined in Section I above, could be done by the non-FFRDC. However, as long as there is an FFRDC funding and/or manpower ceiling, there will be great sensitivity to any work classified as outside of this ceiling. The concern is that the non-FFRDC classification of certain DoD tasks is being used as a method to "end-run" the ceiling limits. Aerospace will submit to SMC/AX in writing its justification for doing this work as a non-FFRDC activity. To help mitigate this problem, the SMC Chief Engineer (SMC/AX) will review this submittal and either approve this effort in writing or call a meeting to discuss the effort. If there is still disagreement after this meeting, it will be resolved between the SMC/Commander and The Aerospace CEO.

IV. REPORTING

All non-FFRDC activities will be reported to SMC/AX annually. A list of all efforts will be adequate. These lists will include 1) task title, 2) very brief task descriptions, 3) funding level,

4) contract duration, and 5) customer. Supporting documentation used by Aerospace in its internal approval cycle will be available upon request by SMC/AX.

AF RELATIONSHIP TO AEROSPACE CORPORATION AND AEROSPACE FFRDC

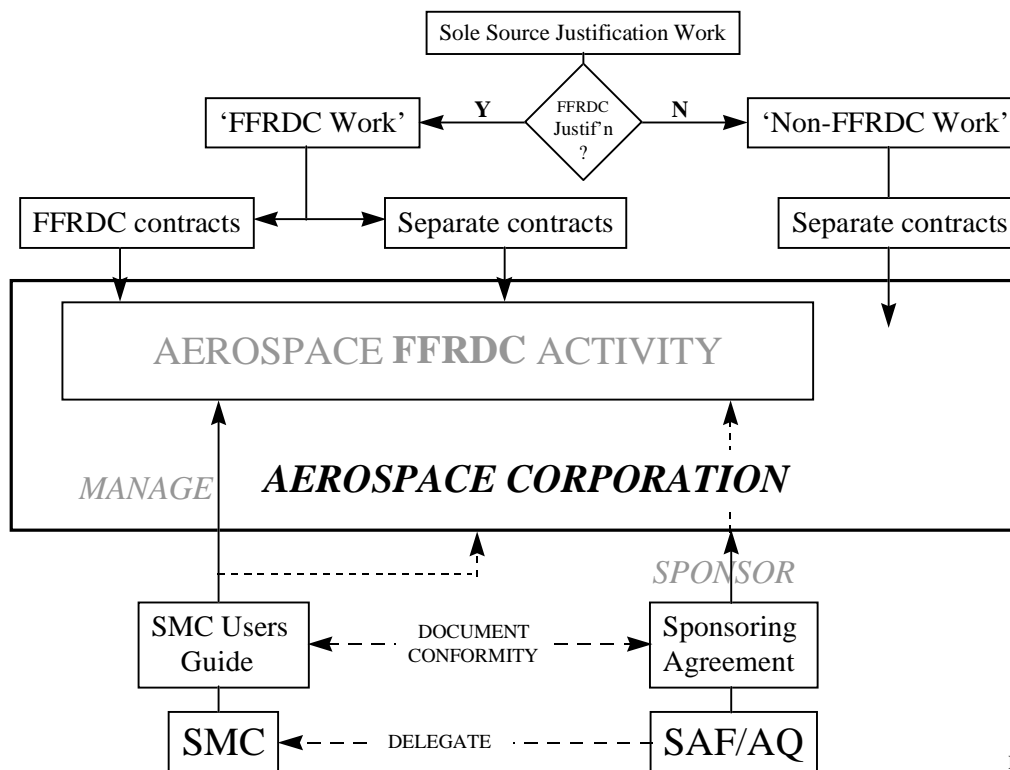


FIGURE 1